

REPORT, RETURNS AND STATISTICS
OF THE
INLAND REVENUES
OF THE
DOMINION OF CANADA
FOR THE FISCAL YEAR ENDED JUNE 30
1901
PART III
ADULTERATION OF FOOD

PRINTED BY ORDER OF PARLIAMENT



OTTAWA
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EXCELLENT MAJESTY

1901

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REPORT

OF THE

DEPUTY MINISTER OF INLAND REVENUE.

INSPECTION OF FOODS, DRUGS AND FERTILIZERS.

To the Honourable M. E. BERNIER,
Minister of Inland Revenue.

SIR,—I have the honour herewith to submit the reports of the official analysts of the Dominion for the fiscal year ended June 30, 1901.

The following is a summary statement of the whole number of samples analysed by them :—

Description of Sample.	Genuine.	Adulter- ated.	Doubtful.	Not Classed.	Total.
Canned salmon	94	5	1	.....	100
Lager beer.....	8	1	1	.....	10
Tea	38	2	.....	.....	40
Aerated waters.....	61	2	6	.....	69
Milk.....	127	18	10	.....	155
Cream cheese	16	9	.....	.....	25
Abbey's effervescing salt.....	1	.....	.....	1	2
Eno's fruit salt.....	1	.....	.....	.....	1
Effervescing phosphate of soda.....	19	40	5	.....	64
Pickles	8	.....	2	.....	10
Cocoa	1	6	.....	.....	7
Jams.....	14	10	8	.....	32
Borax ..	31	3	.....	.....	34
Saltpetre....	25	15	2	.....	42
Baking powder .....	.....	1	.....	.....	1
Cream of tartar	8	1	.....	.....	9
White lead in oil	56	43	.....	.....	99
Fertilizers ..	57	7	.....	1	65
Vinegar	31	9	14	.....	54
Turpentine.....	31	1	.....	.....	32
Linseed oil	25	5	.....	.....	30
Total	652	178	49	2	881

I have the honour to be, sir,
Your obedient servant,
W. J. GERALD,
Deputy Minister

REPORTS OF PUBLIC ANALYSTS.

LABORATORY OF THE OFFICIAL ANALYST FOR
NOVA SCOTIA AND PRINCE EDWARD ISLAND,
66 BEDFORD ROW,
HALIFAX, N.S., August 17, 1901.

The Deputy Minister of Inland Revenue,
Ottawa.

SIR—I have the honour to submit my annual report on the samples of food, &c., analysed by me during the year ending June 30, 1901, as follows :

Sample.	Genuine.	Adulter- ated.	Not Classed.	Total.
Canned salmon.....	16			16
Tea.....	8			8
Ginger beer, &c.....	13			13
Milk.....	21	3		24
Cream cheese.....	1	9		10
Effervescent phosphate of soda.....		10		10
Borax.....	4	1		5
Saltpetre .	3	2		5
Baking powder.....		1		1
Cream of tartar.....		1		1
White lead.....	8	8		16
Fertilizers.....	2	7	1	10
Oil of turpentine	3			3
Raw linseed oil.....		5		5
	79	47	1	127

I have the honour to be, sir,
Your obedient servant,
MAYNARD BOWMAN.

ANNUAL REPORT of the samples analysed in the Quebec Laboratory, from July 1, 1900 to June 30, 1901.

Description of Sample.	Month in which Analysed.	Number of Sample.	Genuine.	Doubtful.	Adulterated.	Sold as Compound	Total.
	1900.						
Canned salmon.....	July.....	16	13	1	2	.....	16
Saltpetre.....	August.....	10	8	.....	2	.....	10
Ginger beer.....	September..	12	6	4	2	.....	12
Lemon sour.....	" ..	2	2	.....	.....	.....	2
Eff. sodium phosphate...	" ..	1	.....	.....	1	.....	1
Pickles.....	October ..	10	8	2	.....	.....	10
Milk.....	November..	24	23	.....	1	.....	24
Eff. sodium phosphate...	December ..	10	5	.....	5	.....	10
	1901.						
Borax.....	January....	5	5	.....	.....	.....	5
Saltpetre	" ..	5	3	.....	2	.....	5
White lead in oil.....	February...	16	7	.....	9	.....	16
Vinegar on pickles.....	March.....	5	1	4	.....	.....	5
Vinegar.....	" ..	5	2	2	1	.....	5
Fertilizers.	April..	10	10	.....	.....	.....	10
Raw linseed oil.....	June	5	5	.....	.....	.....	5
Turpentine.....	"	5	4	.....	1	.....	5
Total .....	.....	141	102	13	26	.....	141

DR. M. Fiset,
Analyst.

LABORATORY INLAND REVENUE,
QUEBEC, July 8, 1901.

OTTAWA, August 19, 1901.

To the Commissioner of Inland Revenue,
Ottawa.

SIR,—I have the honour to make the following report on the inspection of samples which were referred for my examination during the fiscal year ending June 30, 1901.

Sample.	Genuine.	Adulter- ated.	Doubtful.	Total.
Canned salmon	14	.....	.....	14
Tea	7	.....	.....	7
Ginger beer	4	.....	2	6
Lemon sour	6	.....	.....	6
Effervesc. soda phosphate	4	3	4	11
Jams	9	4	1	14
Milk	24	.....	2	26
Saltpetre	3	.....	2	5
Borax	5	.....	.....	5
White lead in oil	7	7	.....	14
Vinegar	5	4	.....	9
Fertilizers	9	.....	.....	9
Oil of turpentine	5	.....	.....	5
Linseed oil	4	.....	.....	4
Total	106	18	11	135

I have the honour to be, sir,
Yours respectfully,

F. X. VALADE, M.D
Public Analys

1-2 EDWARD VII., A. 1902

OTTAWA, September 21, 1901.

To the Commissioner of Inland Revenue,
Ottawa.

SIR,—I have the honour to submit a statement of the work done in my laboratory during the past year. I have analysed 141 samples, of which 118 were reported as unadulterated, 16 as adulterated, and 7 as doubtful. The details of this work are given in the annexed table.

SAMPLES examined by Official Analyst at Toronto during year 1900-01.

Sample.	Genuine.	Adulterated.	Doubtful.	Total.
Canned salmon.....	16			16
Larger beer.....	8	1	1	10
Aerated waters.....	12			12
Effervesc. soda phosphate.....	2	8	1	11
Eno's fruit salts.....	1			1
Potted cheese..	10			10
Milk.....	19		5	24
Saltpetre.....	3	2		5
Borax.....	5	1		6
Vinegar.....	5			5
Vinegar from pickles.....	5			5
White lead in oil.....	12	4		16
Fertilizers.....	10			10
Linseed oil.....	4			4
Turpentine.....	6			6
Totals.....	118	16	7	141

I have the honour to be, sir,

Your obedient servant,

W. HODGSON ELLIS.

OFFICE OF PUBLIC ANALYST,
LONDON, June 30, 1901.

To the Commissioner of Inland Revenue,
Ottawa.

SIR,—I have the honour to present a tabulated statement of results of analyses of samples submitted to me by the department during the past year :—

Samples.	Genuine.	Adulterated.	Doubtful.	Total.
Canned Salmon.....	14	.....	.....	14
Tea.....	5	2	.....	7
Aerated waters.....	10	.....	.....	10
Effervescent salts	1	.....	.....	1
Cocoa.....	1	6	.....	7
Milk.....	18	.....	3	21
Effervescent phosphate of soda....	3	7	.....	10
Saltpetre... ..	2	2	.....	4
Borax.....	4	1	.....	5
Vinegar.	6	3	.....	9
White lead.....	10	4	.....	14
Fertilizers.....	18	.....	.....	18
Oil of turpentine.....	5	.....	.....	5
Raw linseed oil.....	4	.....	.....	4
Totals.....	101	25	3	129

I have the honour to be, sir,
Your obedient servant,

FRANKLIN T. HARRISON.

WINNIPEG, CANADA, July 20, 1901.

To the Commissioner of Inland Revenue,
Ottawa.

SIR,—I have the honour to present a tabulated statement showing the general results of the examination of samples submitted to me by the department during the year ending June 30, 1901 :—

Samples.	Genuine.	Adulter- ated.	Doubtful.	Not Classified.	Total.
Canned Salmon.....	12	0	0	.....	12
Tea.....	12	0	0	.....	12
Ginger beer and lemon sour.....	8	0	0	.....	8
Effervescent sodium phosphate.....	4	5	0	.....	9
Abbey's Effervescent Salt.....	.....	.....	.....	1	1
Borax.....	4	0	0	.....	4
Saltpetre.....	1	3	0	.....	4
White lead in oil.....	6	6	0	.....	12
Vinegar.....	.....	.....	8	.....	8
Fertilizers.....	8	0	0	.....	8
Turpentine.....	4	0	0	.....	4
Linseed oil.....	4	0	0	.....	4
Jam.....	5	6	7	.....	18
Milk..	16	2	0	.....	18
Totals.....	84	22	15	1	122

I have the honour to be, sir,
Your obedient servant,

E. B. KENRICK

SIR,—I beg to submit report for year ending June 30, 1901 :—

I have the honour to be, sir,
Your obedient servant,

C. J. FAGAN.

APPENDIX A.—INSPECTION OF LAGER BEER—Tabulated Statement.

Date of Collection.	Description of Sample, together with Name and Address of Manufacturer when known.	No. of Analyst's Certificate.	No. of Sample.	Result of Analysis.							Remarks of Analyst.	Name and Address of Vendor of Sample.	
				Specific Gravity.			Proof Spirits, Vol. p.c.	Acidity (C.C.N. Alkali per 100 c.c. Beer).	Preservatives.	Ash.			Metallic Contamination.
				Beer at 15°C.	Distillate.	De-alcoholised residue.							
1900.	<i>Official Analyst, Dr. W. H. Ellis, Toronto.</i>						p. c.	c. c.		p. c.			
July 24	Lager Beer, Export, Pabst, Milwaukee.	12485	20740	1·0225	·9941	1·0280	7·10	2·5	None.	0·138	.....	Genuine	L. Laberge, Ottawa.
"	24 Lager Beer, Capital Brewing Co., Ottawa.	12486	20741	1·0142	·9935	1·073	8·00	2·72	Contains salicylic acid.	.....	.....	.....	F. C. Daniels "
"	24 Lager Beer, Imperial Club, The Carling Brewing and Malting Co.	12487	20742	1·0153	·9945	1·0207	6·72	2·02	"	.....	.....	.....	E. De Veaux "
"	24 Lager Beer, Sleeman, Export...	12488	20743	1·0157	·9934	1·0221	8·00	3·63	None.	0·182	.....	Genuine	W. Clarke "
"	25 Lager Beer, Reinhardt, draught, Reinhardt & Co., Toronto.	12489	20744	.....	.....	.....	.....	.....	.....	0·20	1·5 mg. in 100c.c.	This sample of draught beer was sour.	"
"	25 Lager Beer, Salvador, Reinhardt & Co.	12490	20745	1·0141	·9939	1·0212	7·49	3·43	None.	0·204	.....	Genuine	W. Clarke "
"	31 Lager Beer, Special Export, Z. Kuntz, Waterloo, Ont.	12491	20746	1·0144	·9940	1·0203	7·23	3·23	"	0·210	.....	"	Vendor.
"	31 Lager Beer, Pilsener, C. N. Huelther, Berlin, Ont.	12492	20747	1·0123	·9941	1·0175	7·23	3·33	"	0·206	.....	"	"
"	31 Lager Beer, Export, Grants Spring Brewery, Hamilton.	12493	20748	1·0090	·9935	1·0153	8·00	3·63	"	0·208	.....	"	"
"	31 Lager Beer, H. Kuntz, Hamilton.	12494	20749	1·0087	·9929	1·0157	8·77	6·76	"	0·256	.....	"	"

APPENDIX B.—INSPECTION OF TEA—Tabulated Statement.

Date of Collection.	Description of Sample, together with Name and Address of Manufacturer when known.	No. of Analyst's Certificate.	No. of Sample.	RESULT OF ANALYSIS.										Remarks by Analyst.	Name and Address of Vendor of Sample.
				Extd. by ten minutes infusion.			Moisture.	Ash.			Sand, &c.				
				Total solids dissolved.	Tannin.	Theine.		Total.	Soluble.			Insoluble.			
									p. c.	p. c.			p. c.		
Official Analyst, W. Bowman, Halifax, N.S.															
Aug 1900.	6 Tea, black	12830	16788	19.52	3.62	2.25	9.44	5.53	3.23	2.30	0.39	Of low grade, leaves broken, no foreign leaves or facing detected.	J. P. Wambolt, Halifax, N.S.		
"	6 " "	12831	16789	19.50	4.29	2.24	10.48	6.31	3.68	2.63	0.43	"	H. W. Wentzell & Co., Halifax, N.S.		
"	6 " green	12832	16790	32.10	17.36	2.44	6.85	6.27	3.81	2.46	0.41	Unadulterated	A. P. Torrens, Halifax, N.S.		
"	6 " "	12833	16791	31.91	13.26	2.65	7.18	6.05	4.20	1.85	0.20	"	W. C. Anderson, Halifax, N.S.		
"	6 " black	12834	17724	19.90	6.24	2.34	10.32	5.78	3.78	2.00	0.24	Of low grade, leaves much broken, no foreign leaves or facing.	F. Goddard, St. John, N.B.		
"	7 " "	12835	17725	17.10	5.07	2.20	10.90	6.17	3.80	2.37	0.37	"	D. E. Loomer, St. John, N.B.		
"	7 " "	12836	17726	27.96	12.48	2.42	8.67	6.02	3.70	2.32	0.38	Unadulterated, leaves broken, no foreign leaves detected.	G. M. & A. A. Barker, St. John, N.B.		
"	7 " "	12837	17727	26.08	10.53	2.31	10.61	6.15	3.94	2.21	0.35	"	G. L. P. Swetra, St. John, N.B.		
Official Analyst, Dr. F. X. Valade, Ottawa.															
"	2 Tea, green	14733	20733	35.98	11.10	2.57	4.00	5.73	3.41	2.32	0.38	Broken leaves, no dust, genuine	A. E. Cowan, Ottawa		
"	2 " black	14734	20734	23.25	7.13	3.03	7.85	5.20	3.52	1.68	..	"	Bryson, Graham & Co., Ottawa.		
"	2 " "	14735	20735	27.10	7.68	3.32	8.30	5.47	3.77	1.70	0.03	"	R. Barnes, Ottawa		
"	2 " "	14736	20736	21.40	7.25	3.04	8.64	5.14	3.22	1.92	0.11	No perfect leaves, no dust, genuine.	M. W. Sumner, Carleton Place.		
"	2 " green	14737	20737	28.60	10.52	2.70	6.90	6.02	3.84	2.18	0.51	"	A. Daron, Carleton Place.		
"	2 " black	14738	20738	24.40	7.54	3.41	9.62	5.28	3.41	1.87	0.23	"	R. E. Hicks, Perth, Ont.		
"	2 " green	14739	20739	32.05	11.70	2.71	4.89	6.38	3.87	2.51	0.74	"	Mrs. Powell		

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"	6	Ginger Beer, R. Millar, Montreal...	13702	19963	0·63	0·79	1·39	"	Liquid tastes and smells of ginger, and contains some sediment; genuine.	N. Tremblay, 315 Commissioners St., Montreal.
"	6	" Rowan & Bros., Montreal	13703	19964	0·63	0·79	....	1·39	"	"	R. Coogan, 243 Commissioners St., Montreal.
"	7	Lemon Sour, J. H. Bryant, Sherbrooke	13704	19965	0·16	0·20	.....	0·35	Traces iron and lead.	Liquid tastes and smells of lemons, and contains no sediment; genuine.	J. A. McDonnell, King St., Sherbrooke.
"	7	Ginger Beer, S. C. Nuther, Sherbrooke	13705	19966	1·50	1·88	....	3·30	Traces iron.	Liquid tastes and smells of ginger, and contains some sediment; above British limit in alcohol; 2 p. c. proof spirit.	"
"	8	" P. O. Milloy, Montreal..	13707	19968	0·63	0·79	....	1·39	Traces lead.	Liquid tastes and smells of ginger, and contains some sediment; genuine.	T. Belanger, 2040, St. Catherine St., Montreal.
"	8	" Gurd & Co., Montreal...	13708	19969	2·00	2·51	.....	4·40	Traces iron and lead.	Liquid tastes and smells of ginger, and contains some sediment; much above British limit (2 p. c. proof spirit) in alcohol.	A. Sicotte, 657 Dorchester St., Montreal.
"	17	" M. Timons & Sons, Quebec	13709	19970	0·21	0·26	..	0·46	Traces iron.	Liquid tastes and smells of ginger, and contains some sediment; genuine.	Geo. Lemelin, 1st Joseph St., Quebec.
"	17	" A. Crawford, Quebec ...	13710	19971	0·68	0·86	. ....	1·51	"	"	M. A. Bryant, St. Paul St., Quebec.
"	17	" J. Coté, Quebec.	13711	19972	0·21	0·26	.....	0·46	"	"	J. Champaquat, St. Paul St., Quebec.
"	18	" J. Rousseau.....	13712	19973	1·25	1·57	....	2·75	Traces iron, lead 4.	Liquid tastes and smells of ginger, and contains some sediment; above British limit (2 p. c. proof spirit) in alcohol; slightly contaminated with lead; traces sulphates present.	C. Thibault, Victoriaville.
"	24	" Goulet Bros., Montreal..	13713	19974	0·16	0·20	...	0·35	Lead 17....	Liquid tastes and smells of ginger, and contains some sediment; contaminated with lead.	M. L. Denis, 2200 Notre Dame St., Montreal.
"	25	" Robt. Allan, Montreal...	13714	19975	1·31	1·65	.....	2·89	Lead 5, trac. iron.	Liquid tastes and smells of ginger, and contains some sediment; above British limit in alcohol; slightly contaminated with lead.	M. Patenaude, 1738 St. Catherine St., Montreal.
"	25	" J. Christin & Co., Montreal	13715	19976	0·79	0·99	....	1·74	Lead 13, trac. iron.	Liquid tastes and smells of ginger, and contains some sediment; contaminated with lead.	A. Bolinini, 1321 St. Catherine St. Montreal.

APPENDIX C.—INSPECTION OF AERATED WATERS—Tabulated Statement—Concluded.

Date of Collection.	Description of Sample, together with Name and Address of Manufacturer when known.	No. of Analyst's Certificate.	No. of Sample.	RESULT OF ANALYSIS.					Remarks by Analyst.	Name and Address of Vendor of Sample.
				Alcohol by Weight.	Alcohol by Volume.	Metals.	Proof Spirits.	Metals.		
				p. c.	p. c.		p. c.			
1900.	<i>Official Analyst, Dr. F. X. Valade, Ottawa.</i>									
Aug. 31	Ginger beer, McLaughlin & Co., Toronto.	14740	20750	1.69	.....	None.....	...	.....	No gas; the bottle was only one-fourth full; doubtful; the percentage of alcohol is rather high.	S. Mills, O'Connor St., Ottawa.
" 31	" " E. Hall, Ottawa.....	14741	20751	1.37	.....	" " " " " "	.....	.....	" " " "	" " " "
" 31	" " Huckell & Co., Ottawa.	14742	20752	0.53	.....	" " " " " "	.....	.....	Doubtful; the percentage of alcohol is rather high.	S. Daniels, Metcalfe St. " "
" 31	" " E. Mireault, Ottawa....	14743	20753	1.06	.....	Faint trace of tin.	.....	.....	Genuine.....	S. W. Lee, Elgin St. " "
" 31	" " F.M.Pilgrim, Brockville	14744	20754	0.95	.....	None....	...	.....	" " " "	W. R. Queale, "The Bodega," Elgin St., Ottawa.
Sept. 1	" " Gurd, Montreal.....	14745	30755	0.39	.....	" " " " " "	.....	.....	" " " "	Gilhuour Hotel, Bank St., Ottawa
" 1	Lemon sour, F.M.Pilgrim, Brockville	14746	20756	0.74	.....	" " " " " "	.....	.....	" " " "	S. Mills, O'Connor St. " "
" 1	" " E. Mireault, Ottawa....	14747	20757	0.74	.....	" " " " " "	.....	.....	" " " "	S. W. Lee, Elgin St. " "
" 1	" " Huckell & Co. " " " "	14748	20758	1.06	.....	Doubtful trace of lead.	.....	.....	" " " "	S. Daniels, Metcalfe St. " "
" 1	" " Mineral Water Co., Arnprior.	14749	20759	1.06	.....	None....	.....	.....	" " " "	F. Boissio, 215 Bank St. " "
" 1	" " R. Irvine, Ottawa	14750	20760	0.53	.....	" " " " " "	.....	.....	" " " "	Piller, 607 Somerset St. " "
" 1	" " " " " " " "	14751	20761	0.65	.....	" " " " " "	.....	.....	" " " "	F. Lavorato, Bank St. " "
	<i>Official Analyst, Dr. W. H. Ellis, Toronto.</i>									
" 5	Ginger beer, Vendor ...	12495	20764	1.014	.....	None.....	.....	.....	.....	R. Irvine, Smith's Falls.
" 5	Lemon sour " " " " " "	12496	20765	None.	.....	Trace iron	.....	.....	.....	" " " "
" 6	" " D. Knox, Peterboro'...	12497	20766	" " " "	.....	" " " "	.....	.....	.....	G. Graham, Oriental Hotel, Peterboro'.
" 6	Ginger beer, James " " " "	12498	20767	0.21	.....	None.....	.....	.....	.....	" " " "
" 6	Ginger ale, Pilgrim, Hamilton.....	12499	20768	None.	.....	Trace iron	.....	.....	.....	Brown & Co., grocers, Peterboro'.

SESSIONAL. PAPER No. 14

CREAM CHEESE—Tabulated Statement.

ANALYSIS.				Remarks by Analyst.	Name and Address of Vendor of Sample.
C. C. Decinormal Ammonia for 5 grms. Fat Reich-ert's Test.	Salt.	Preservative.	Boracic Acid.		
	p. c.	p. c.	p. c.		
26·41	.....	.....	.....	Adulterated ; being deficient in butter fat.	Wood Bros., St. Lawrence St., Montreal.
27·28	.....	.....	.....	" ..	Puddington & Meritt, 55 Charlotte St., St. John, N.B.
21·99	.....	.....	.....	That presence of fat, other than that of butter, is doubtful, but is adulterated, being deficient in butter fat.	Vanwart Bros., cor. Duke and Charlotte Sts., St. John, N.B.
24·07	.....	.....	.....	" ..	W. Cunningham, Rideau St., Ottawa.
27·51	.....	.....	.....	Adulterated ; being deficient in butter fat.	A. E. Cowan, Sparks St., Ottawa.
.....	.....	.....	.....	" ..	R. McGregor ..
27·05	.....	.....	.....	" ..	C. Stratton, 99 Lyon St., Ottawa.
28·20	.....	.....	.....	" ..	S. A. Benbacker, Berlin, Ont.
.....	.....	.....	.....	" ..	Jackson & Son, Guelph.
.....	.....	.....	.....	" ..	Jas. Patterson, Fergus.
.....	1·34	None ..	.....	Rather low for a cream cheese.....	J. L. Archibald & Son, Halifax, N.S.
.....	2·02	" ..	.....	Genuine ..	W. C. Anderson, Halifax, N.S.
.....	1·74	" ..	.....	" ..	J. Duncan, St. Joseph St., Lachine, Que.
.....	1·45	" ..	.....	" ..	F. Marchand, Richelieu St., St. Johns, Que.
.....	1·01	" ..	.....	The fat is too low for a cream cheese	W. McCowan & Son, 337 St. Lawrence St., Montreal.
.....	1·89	" ..	.....	Genuine ..	F. X. St. Charles & Co., 255 St. Lawrence St., Montreal.
.....	1·82	" ..	.....	" ..	Jackson & Son, Guelph.
.....	1·48	" ..	.....	The fat is too low for a cream cheese	Jackson & Campbell, Winnipeg.
.....	5·31	" ..	.....	Genuine " ..	" ..
.....	3·96	" ..	.....	Genuine ; fat below average for cream cheese.	" ..
.....	None ..	.....	None ..	Genuine ..	Pantry Grocery, Vancouver, B.C.
.....	" ..	.....	" ..	" ..	Ideal Grocery ..
.....	" ..	.....	" ..	" ..	Foran & Frost ..
.....	" ..	.....	" ..	" ..	Mowat & Wallace, Victoria, B.C.
.....	" ..	.....	" ..	" ..	Erskine, Wall & Co. ..

APPENDIX E.—INSPECTION

Date of Collection.	Description of Sample, together with Name and Address of Manufacturer when known.		No. of Analyst's Certificate.	No. of Sample.	Moisture.	Ash, Total.	ASH.	
							Insoluble.	Soluble in Hcl.
1900.	<i>Official Analyst, F. T. Harrison, London, Ont.</i>				p. c.	p. c.	p. c.	p. c.
Oct. 3	Cocoa, John P. Mott & Co., Halifax, N.S.....		14257	17739	7·30	5·72	3·13	0·13
" 1	" Cowan & Co., Toronto		14261	19986	3·65	3·93	1·25	0·11
Sept. 27	" Webb, Milton, Mass.....		14262	20783	5·50	8·65	4·55	1·15
Oct. 1	" Cowan & Co., Toronto.....		14263	20788	6·70	5·50	1·19	0·15
" 1	" " " "		14258	19391	4·20	2·34	1·04	0·17
" 3	" Webb, Milton, Mass.....		14259	19395	6·00	9·95	5·10	1·70
" 4	" Todhunter & Mitchell, Toronto.....		14260	19397	3·75	1·80	0·65	0·05

SESSIONAL PAPER No. 14
OF COCOA—Tabulated Statement.

Fat.	Cane Sugar.	Theobromine.	Caffeine.	Remarks by Analyst.	Name and Address of Vendor of Samples,
p. c.	p. c.	p. c.	p. c.		
19·00	None.	1·50	0·84	Adulterated by abstraction of fat. The caffeine would indicate an admixture, but I failed to find any indication of it microscopically.	Baird & Peters, 20 Ward St., St. John, N. B.
12·42	32·48	0·78	0·18	Adulterated, being deficient in fat and contains sugar and fat.	Massicotte & Co., 1470 St. Catherine, Montreal.
17·02	None.	1·08	0·26	Adulterated by abstraction of fat...	A. E. Cowan, Sparks St., Ottawa.
32·40	"	1·20	0·20	Has a portion of the fat removed...	G. Miller, O'Connor St., Ottawa.
7·40	42·13	0·50	0·18	Adulterated, being deficient in fat and by addition of sugar starch.	B. B. Gunn, Seaforth, Ont.
18·06	None.	1·08	0·28	Adulterated by abstraction of fat...	Dunke & Co., Berlin, Ont.
20·00	31·40	0·56	0·10	Adulterated by addition of sugar and flour.	Scroggie Brothers, Guelph, Ont.

APPENDIX F.—INSPECTION

Date of Collection.	Description of Sample, together with Name and Address of Manufacturer when known.	No. of Analyst's Certifi- cate.	No. of Sample.	RESULT OF					
				Loss at 100° C.	Total Solids.	Invert Sugar.	Cane Sugar.	Total Sugar.	Gelatine.
1900.	<i>Official Analyst, Dr. F. X. Valade, Ottawa.</i>			p. c.	p. c.	p. c.	p. c.	p. c.	p. c.
Oct. 3	Jam, Plum, Southwell & Co., London, Eng.	14753	17740	.....	78·47	48·82	23·63	72·45	None.
Sept. 28	Jam, Plum, G. Perreault, Montreal.....	14758	19980	.....	71·27	61·37	4·76	66·13	"
" 28	Jam, Strawberry, G. Perreault, Montreal.	14759	19981	.....	70·97	53·62	18·27	71·89	"
" 29	Jam, Raspberry, Asiatic Trading Co., Montreal.	14760	19983	.....	78·81	52·62	18·27	70·89	"
" 29	Jam, Strawberry, Montreal Canning Co..	14761	19984	....	63·93	45·27	11·53	56·80	"
" 29	Jam, Plum, Montreal Canning Co....	14762	19985	....	61·26	54·08	3·13	57·21	"
Oct. 1	Jam, Strawberry, J. Lamoureaux, labelled Western Fruit Pkg. Co.	14763	19987	....	70·69	61·26	4·42	65·68	"
Sept. 27	Jam, Black Raspberry, vendor.....	14764	20781	....	64·53	47·38	7·13	54·51	"
" 27	Jam, Plum, T. O. Lytle & Co., Toronto..	14765	20784	.....	67·25	37·72	24·42	62·14	"
" 27	Jam, Strawberry, T. O. Lytle & Co., Toronto.	14766	20785	.....	62·46	44·88	11·16	56·04	"
Oct. 2	Jam, Raspberry, T. Upton & Co., Ham- ilton.	14754	19392	...	72·33	40·46	24·72	65·18	"
" 2	Jam, Plum, T. Upton & Co., Hamilton..	14755	19393	.....	73·22	61·28	6·73	68·01	"
" 2	Jam, Gooseberry, T. Upton & Co., Ham- ilton.	14756	19394	.....	71·46	56·62	10·73	67·35	"
" 5	Jam, Strawberry, Toronto Biscuit Co....	14757	19402	....	72·69	60·49	4·57	65·06	"
	<i>Official Analyst, Prof. E. B. Kenrick, Winnipeg.</i>								
" 4	Jam, Raspberry, Upton & Co., Hamilton.	11464	20002	...	70·88	.....	.....	65·04	None.
" 4	Jam, Strawberry, The Simcoe Canning Co, Simcoe, Ont.	11465	20004	....	69·19	.....	...	64·53	"
" 5	Jam, Strawberry, Woodstock Pure Food Co., Woodstock, N.B.	11466	20006	.....	62·15	..	...	60·01	"
" 5	Jam, Plum, The Simcoe Canning Co.....	11467	20007	.....	66·40	...	.....	51·33	"
" 9	Jam, Strawberry, Maritime Pure Food Co., Woodstock, N.B.	11462	17741	.....	61·49	.....	.....	53·75	"
" 10	Jam, Plum and Damson, Ayr Preserving Co., Ayr, Mass., U.S.A.	11463	17743	....	70·04	.....	.....	62·70	None.
" 1	Jam, Strawberry, T. A. Lytle & Co., Toronto.	11468	20790	....	72·63	.....	.....	65·14	"
" 1	Jam, Plum, The Canada Preserving Co., Hamilton.	11469	20791	....	68·72	.....	...	50·25	"

SESSIONAL PAPER No. 14
OF JAM—Tabulated Statement.

ANALYSIS.							Remarks by Analyst.	Name and Address of Vendor of Sample.
Foreign Colouring.	Antiseptics.	Fruit true to name.	Fruit of good quality.	Insoluble in water.	Ash.	Metallic Contamination.		
None	None	Correct.	Good.	. . . . .	. . . . .	. . . . .	Unadulterated.	W. O. Porter, 215 Union St., St. John, N.B.
Slight trace.	"	Prunes..	Poor . . . . .	. . . . .	. . . . .	. . . . .	Of poor quality. The presence of prunes gives an undesirable appearance to the jam.	A. Lacombe, 2507 Notre Dame St., Montreal.
Slight amt., probably magenta.	"	Not	Good. . . . .	. . . . .	. . . . .	. . . . .	Raspberry with apple tissue and plum. Adulterated.	" "
None	"	Correct.	" . . . . .	. . . . .	. . . . .	. . . . .	Unadulterated.	L. P. Forrest, 1976 St. Catherine St., Montreal.
Very slight trace.	" . . . . .	" . . . . .	" . . . . .	. . . . .	. . . . .	. . . . .	" . . . . .	A. Renaud & Co., 512 Craig St., Montreal.
Present. . . . .	" . . . . .	" . . . . .	" . . . . .	. . . . .	. . . . .	. . . . .	" but stained.	" "
Very faint trace.	"	Not . . . .	" . . . . .	. . . . .	. . . . .	. . . . .	Some apple, some strawberry and one fig seed. Adulterated.	A. Lamendreau & Père, Montreal.
None	"	Correct.	" . . . . .	. . . . .	. . . . .	. . . . .	Unadulterated.	R. Barnes, Rideau St., Ottawa.
" . . . . .	" . . . . .	" . . . . .	" . . . . .	. . . . .	. . . . .	. . . . .	" . . . . .	Gilmour House Grocery, Ottawa.
Small amt., & probably magenta.	Salicylic acid	Not . . . .	" . . . . .	. . . . .	. . . . .	. . . . .	Chiefly apple jam. Adulterated.	" "
Very small quantity.	None	Raspberries & apples	" . . . . .	. . . . .	. . . . .	. . . . .	Very few raspberry seeds. Much peachy-like apple pulp. Adulterated.	A. G. Lloyd, Stratford.
None	"	Correct.	" . . . . .	. . . . .	. . . . .	. . . . .	Unadulterated.	Barnsdale Trading Co., Stratford.
"	Considerable quantity salicylic.	" . . . . .	" . . . . .	. . . . .	. . . . .	. . . . .	Adulterated. Containing a certain amount of salicylic acid.	Dunke & Co., Berlin, Ont.
Trace of aniline colour.	" . . . . .	" . . . . .	" . . . . .	. . . . .	. . . . .	. . . . .	" " . . . . .	Jno. McKim, Orangeville.
Probably present.	None found.	Yes	Yes . . . . .	. . . . .	. . . . .	. . . . .	Probably adulterated	W. J. Hopgood, Halifax, N.S.
" . . . . .	" . . . . .	" . . . . .	" . . . . .	. . . . .	. . . . .	. . . . .	Apple tissues, adulterated..	C. S. Davis, Halifax, N.S.
Doubtful. . . .	" . . . . .	" . . . . .	" . . . . .	. . . . .	. . . . .	. . . . .	Genuine	De Wolf & Lamon, Kentville, N.S.
" . . . . .	" . . . . .	" . . . . .	" . . . . .	. . . . .	. . . . .	. . . . .	Doubtful.	Stroud Bros., Windsor, N.S.
None. . . . .	" . . . . .	" . . . . .	" . . . . .	. . . . .	. . . . .	. . . . .	Genuine	W. R. Logan, Queen St., Fredericton, N.B.
Probably present.	" . . . . .	" . . . . .	" . . . . .	. . . . .	. . . . .	. . . . .	Stated on pot to contain 25 per cent of apple.	G. M. & A. A. Barker, Queen St., Fredericton, N.B.
Doubtful. . . .	" . . . . .	" . . . . .	" . . . . .	. . . . .	. . . . .	. . . . .	Doubtful.	Baird & Riddell, Carleton Place, Ont.
Probably present.	" . . . . .	" . . . . .	" . . . . .	. . . . .	. . . . .	. . . . .	" . . . . .	Mrs. A. Dares, Carleton Place, Ont.

APPENDIX F.—INSPECTION OF

Date of Collection.	Description of Sample, together with Name and Address of Manufacturer when known.	No. of Analyst's Certifi- cate.	No. of Sample	RESULT					
				Loss at 100°c.	Total Solids.	Invert Sugar.	Cane Sugar.	Total Sugar.	Gelatine.
1900.	<i>Official Analyst, Prof. E. B. Kenrick, Winnipeg.—Con.</i>			p. c.	p. c.	p. c.	p. c.	p. c.	p. c.
Oct. 10	Jam, Raspberry, Toronto Biscuit Co.....	11458	17276	.....	66·45	.....	...	60·43	None.
" 10	Jam, Strawberry, Thos. Upton, Hamilton.	11459	17277	.....	69·13	.....	.....	63·97	" .
" 10	Jam, Strawberry, The Dyson Gibson Co., Winnipeg.	11460	17278	...	70·19	.....	.....	65·52	" .
" 10	Jam, Plum, vendors.....	11461	17279	...	75·23	.....	.....	65·04	" .
	<i>Official Analyst, Dr. C. J. Fagan, Victoria, B.C.</i>								
July 18	Jam, Raspberry, Simcoe Canning Co.....	15093	21508	28·5	.....	39·7	2·5	.....	.....
" 19	Jam, Black Currant, Toronto Packing Co.	15095	21509	27·6	.....	38·4	3·1	.....	.....
" 20	Jam, Plum, Dyson Gibson Co., Winnipeg	15010	21510	26·3	.....	40·00	5·1	.....	.....
" 20	Jam, Raspberry, T. A. Lytle, Toronto...	15094	21511	27·00	.....	40·00	12·00	.....	.....
" 31	Jam, Peach, M. Lefebvre, Montreal	15098	21512	27·8	..	32·0	19·0	.....	.....
" 31	Jam, Strawberry, O'Kell & Monis, Vic- toria.	15097	21513	24·00	...	43·1	15·6	.....	.....
" 31	Jam, Raspberry, Climax Preserving and Packing Co., Vancouver.	.....	21514	24·7	....	32·0	35·5	...	.....

SESSIONAL PAPER No. 14

JAM--Tabulated Statement--Continued.

OF ANALYSIS.							Remarks by Analyst.	Name and Address of Vendor of Sample.
Foreign Colouring.	Antiseptics.	Fruit true to name.	Fruit of Good Quality.	Insolubles in water.	Ash.	Metallic Contamination.		
Doubtful....	None found.	Yes...	Yes ..	.....	...	..	Apparently genuine	R. Fairley, Winnipeg.
Probably present.	" ..	Unab	le to say.	...	...	...	Sold as strawberry jelly. The colouring matter appears to be identical with that of the two samples of raspberry jam Nos. 17276 and 20002.	P. Minark.
Doubtful....	" ..	Yes ..	Yes ..	.....	.....	.....	Doubtful.	J. Coltart.
" ..	" ..	" ..	" ..	.....	.....	.....	" ..	The Blackwood's, Ltd.
None.....	.....	.....	.....	2.41	0.46	None.	Genuine	Wilson Bros., Victoria, B.C.
" ..	.....	.....	.....	1.74	0.59	" ..	" ..	Hardress Clarke, Victoria, B.C.
" ..	.....	.....	.....	0.72	0.21	" ..	" ..	Johns Bros., Victoria, B.C.
Magenta ...	.....	.....	.....	3.92	0.39	" ..	Adulterated with magenta.	G. E. Munroe & Co., Victoria, B.C.
None.....	.....	.....	.....	4.21	.....	" ..	Genuine	H. Hesson, Vancouver.
" ..	.....	.....	.....	1.91	0.41	" ..	" ..	S. Fades & Co., Vancouver.
" ..	.....	.....	.....	2.45	0.26	" ..	" ..	Carmichael & Dickie, Vancouver.

APPENDIX G — INSPECTION OF PICKLES—Tabulated Statement

Date of Collection.	Description of Sample, together with Name and Address of Manufacturer when known.	No. of Analyst's Certificate.	No. of Sample.	Result of Analysis.					Remarks by Analyst.	Name and Address of Vendor of Sample.
				Acetic Acid in the liquid of the pickles, (grms. per 100 C. C.)	Sulphuric Acid.	Alumina.	Free Mineral Acid.	Metals.		
1900.	<i>Official Analyst, Dr. M. Fiset, Quebec.</i>			p. c.	p. c.	p. c.				
Oct.	4 Mixed Pickles, Davidson Bros., Halifax, N.S.	13723	20005	1.86	0.08	0.04	None	Trace copper	Some of the vegetables too ripe when pickled, but well preserved; a little copper present; doubtful.	C. S. Davis, Halifax.
"	3 Pickles, Mixed, Sun Brand, Brosseau & Co., Montreal.	13716	17736	1.75	0.06	0.03	...	None	" genuine.....	Baird & Peters, 16 Maud St., St. John, N.B.
Sept.	28 Pickles, Mixed, Klondike, J. Lambert, Montreal.	13719	19977	1.66	0.05	0.02	.....	"	Genuine.....	J. Dion, 2582 Notre-Dame, Montreal.
"	28 Pickles, Mixed, Royal, G. Perreault, Montreal.	13720	19979	1.59	0.03	Trace	.....	"	"	O. Lacombe, 2507 Notre-Dame, Montreal.
"	27 Pickles, Mixed, Sun Pickle Works, London, Ont.	13721	20780	2.05	0.03	"	.....	"	"	T. R. Davies, Rideau St., Ottawa.
Oct.	1 Pickles, Mixed, Canada Pickling Co., Toronto.	13722	20789	2.30	0.07	0.01	.....	"	"	Baird & Riddell, Carleton Place.
"	4 Pickles, Mixed, H. P. Eckhardt & Co., Toronto.	13717	19400	1.16	0.06	0.02	.....	"	" but not in good condition.	Armstrong Bros., Fergus, Ont.
"	5 Pickles, Mixed, E. Blain & Co., Toronto.	13718	19401	2.08	0.06	0.03	.....	"	"	S. Donner, Orangeville.
"	9 Pickles, Mixed, White Star, The Dyson, Gibson Co., Winnipeg.	13724	17273	2.34	0.15	0.05	.....	Trace copper	Doubtful.	R. J. Gallagher, Winnipeg.
"	9 Pickles, Mixed, Blackwood's, The Blackwood Co., Ltd., Winnipeg.	13725	17274	2.60	0.05	Trace	...	None	Genuine.....	W. B. Francis, Winnipeg.

APPENDIX H.—INSPECTION OF SALTPETRE—Tabulated Statement.

Date of Collection.	Description of Sample, together with name and address of Manufacturer when known.	No. of Analyst's Certif. cate.	No. of Sample.	RESULT OF ANALYSIS.				Remarks by Analyst.	Name and address of Vendor of sample.
				Moisture.	Soda, Na ₂ O.	Potash.	Nitrogen.		
				p. c.	p. c.	p. c.	p. c.		
1901.	<i>Official Analyst, M. Borman, Halifax, N.S.</i>								
Jan. 29	Saltpetre, Brown & Webb, Halifax	12905	20026	0·18	2·86	43·47	13·16	Unadulterated, contains a trace of chloride also of soda.	M. D. Logan, druggist, Halifax.
" 29	" Simpson Bros "	12906	20027	0·13	5·35	40·82	12·57	Adulterated, containing a considerable amount of chloride also soda.	Hattie & Mylins " .
" 29	"	12907	20028	0·07	. . . . .	. . . . .	12·66	Unadulterated	C. E. Huggins " .
" 25	" Andrews & Co., Liverpool, E	12908	17763	0·55	. . . . .	. . . . .	12·18	Adulterated, containing a considerable amount of chloride.	Bowman & Angvine, grocers, 28 Water St., St. John, N.B.
" 29	" T. B. Barker & Son, St. John	12909	17765	0·19	0·21	46·30	13·24	Unadulterated, contains a trace of chloride.	R. T. Mack, druggist, Queen St., Fredericton, N.B.
"	<i>Official Analyst, Dr. M. Fiset, Quebec.</i>								
" 25	Saltpetre, Kerry Watson Co.	13763	18986	0·14	None.	46·46	13·82	Genuine saltpetre	J. A. Pelletier, druggist, Three Rivers, P.Q.
" 25	" "	13764	18987	0·08	"	46·31	13·79	"	R. W. Williams, druggist, Three Rivers, P.Q.
" 29	"	13767	18990	0·53	36·44	None.	16·45	Adulterated, being nitrate of soda.	A. A. J. Gingras, grocer, 55 Dominique St., Quebec.
" 29	" E. Morin, Quebec	13768	18991	0·44	36·41	"	16·44	"	J. B. Morin, druggist, 325 St. Joseph St., Quebec.
" 30	" Kerry, Watson Co.	13771	18994	0·09	None.	46·40	13·81	Genuine	J. B. Morin, druggist, Levis.
"	<i>Official Analyst, Dr. F. X. Valade, Ottawa.</i>								
" 9	Saltpetre	14801	20541	0·022	. . . . .	46·17	13·72	Good	Nolan & Payment, druggists, cor. Division and Wellington Sts., Ottawa.
" 9	"	14802	20542	0·038	. . . . .	46·36	13·86	"	Skinner & Co., druggists, Ottawa
" 9	"	14803	20543	0·022	. . . . .	46·12	13·78	"	Graham & Elliott "

Date of Collection.	Description of Sample, together with Name and Address of Manufacturer when known.	No. of Analyst's Certificate.	No. of Sample.	RESULT OF ANALYSIS.					Remarks by Analyst.	Name and Address of Vendor of Sample.
				Moisture.	Soda Na ₂ O.	Potash.	Nitrogen.	Impurities.		
1901.	Official Analyst, Dr. F. X. Valade, Ottawa.			p. c.	p. c.	p. c.	p. c.	p. c.		
Jan. 9	Saltpetre.....	14804	20544	0·656	34·22	1·58	15·68	Magnesia present.	Mainly nitrate of soda and having been sold as salt-petre is adulterated according to the Act.	Hand & Phillips, grocers, cor. Somerset and Division Sts., Ottawa.
" 9	"	14805	20545	0·024	32·67	2·93	15·40	"	"	R. Baird, grocer, cor. Somerset and Percy Sts., Ottawa.
" 22	Official Analyst, Dr. W. H. Ellis, Toronto.									
" 22	Saltpetre, Stinson & Co., Kingston.....	16053	20550	.....	37·36	.....	14·96	.....	Nitrate of soda and therefore adulterated if sold as salt-petre.	J. W. Harrison, druggist, Gananoque.
" 23	" Lyman Knox, Toronto.....	16054	20551	.....	.....	45·89	13·66	.....	Genuine.....	A. W. Gauge & Bro., druggist, Gananoque.
" 24	"	16055	20552	.....	34·90	2·47	14·73	.....	Adulterated by admixture with about 85 p. c. of sodium nitrate.	Joy & Perry, grocers, Napanee.
" 24	" Lyman Bros., Toronto.....	16056	20553	.....	.....	45·90	12·87	.....	Genuine.....	J. R. Bound, druggist, Yonge St., Toronto.
" 24	" Not known.....	16057	20554	.....	.....	46·76	13·45	.....	"	John Giles, grocer, Toronto.
" 17	Official Analyst, F. T. Harrison, London, Ont.									
" 17	Saltpetre, Lyman Bros., Toronto.....	14294	19435	0·35	Trace.	46·35	13·80	Trace.	Contains a trace of chlorides; unadulterated.	W. A. Karn, druggist, Woodstock, Ont.
" 17	" W. G. Coles, Broker, London, Ont.	14295	19437	0·05	36·29	Trace.	16·39	None.	Considerable trace of chlorine; adulterated, being nitrate of sodium and not nitrate of potassium.	Scandrett Bros., grocers, 175 Dundas St., London, Ont.

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"	18	"	"	14296	19440	0·60	36·41	None.	16·44	"	Traces of chlorides; adulterated, being nitrate of sodium and not nitrate of potassium.	G. H. Nairn, grocer, Windsor, Ont.
"	18	"	London Drug Co.....	.....	14297	19442	0·05	None.	46·51	13·85	"	Unadulterated; this is a very pure sample.	J. E. A. Vignon, druggist, Windsor, Ont.
"	23	"	<i>Official Analyst, Prof. E. B. Kenrick, Winnipeg.</i>		17011	17304	0·26	36·45	None.	16·46	None.	Pure nitrate of soda, but having been sold as salt-petre is adulterated according to the Act.	C. T. Hassefield, druggist, Winnipeg.
"	23	"	The Bole Drug Co.....	.....	17012	17305	0·04	None.	46·63	13·89	"	Genuine	J. A. Snider, druggist, Winnipeg.
"	24	"	Campbell Bros. & Wilson, Winnipeg		17013	17306	0·06	36·50	None.	16·50	"	Pure nitrate of soda, but having been sold as salt-petre is adulterated according to the Act.	W. H. McLean, grocer, Winnipeg.
"	24	"	The A. Macdonald Co., Winnipeg		17014	17307	0·06	36·38	"	16·44	Traces of iron.	"	Jackson & Campbell, grocers, Winnipeg.
Feb.	14	"	<i>Official Analyst, Dr. C. J. Fagan, Victoria, B.C.</i>		16964	21549	0·57	46·08	25·27	17·9	.....	A mixture of soda salt-petre and salt-petre, and is adulterated if sold as salt-petre.	L. Dickinson, grocer, Victoria.
"	14	"	Gillet & Co., Toronto...	.....	16965	21551	2·5	.....	76·25	16·9	.....	Genuine	John Cochrane, druggist, Victoria.
"	16	"	Uncertain.....	.....	16966	21556	0·17	.....	78·3	17·5	.....	"	McDowell & Watson Co., druggists, Vancouver.
"	16	"	A. Wilson & Co., Hamilton	.....	16967	21558	3·7	65·74	....	17·1	.....	A soda salt-petre and is adulterated if sold as salt-petre.	Dr. J. McAlpin, druggist, Vancouver.

APPENDIX I.—INSPECTION OF BORAX—Tabulated Statement.

Date of Collection.	Description of Sample, together with Name and Address of Manufacturer when known.	No. of Analyst's Certificate.	No. of Sample.	Result of Analysis.					Remarks by Analyst.	Name and Address of Vendor of Sample.
				Total Water by ignition.	Total alkalinity (as Na ₂ O).	Carbonic Acid.	Soda combined therewith.	Impurities.		
1901.	<i>Official Analyst, M. Borman, Halifax, N.S.</i>			p. c.	p. c.	p. c.	p. c.	p. c.		
Jan. 29	Borax, Pure Gold Manufacturers, Co., Toronto.	12887	20029	43·32	17·59	Nil...	Nil...	.....	Unadulterated; has been partially dried.	T. F. Courtney & Co., grocer, Halifax
" 29	" Brown & Webb	12888	20030	47·00	16·37	" ....	" ....	.....	Unadulterated	Jas. McFatrige, druggist "
" 22	" Imported from London, Eng..	12889	17761	47·00	16·37	" ..	" ..	.....	"	The Canadian Drug Co., Ltd., 60 Prince Wm. St., St. John, N.B.
" 23	" T. B. Barker & Son, Limited, St. John.	12890	17762	46·99	16·37	" ....	" ....	.....	"	T. E. Williams, grocer, cor. Princess and Charlotte Sts., St. John, N.B.
" 29	" The Oriental Co., 33 Front St. E., Toronto.	12892	17764	43·57	24·77	14·90	20·84	....	Adulterated being largely composed of sodium carbonate.	E. H. Boone, grocer, Queen St., Fredericton, N.B.
Jan. 25	<i>Official Analyst, Dr. M. Fiset, Quebec.</i> Borax, Kerry, Watson & Co.....	13762	18985	46·62	16·43	None.	None.	..	Genuine..	J. A. Pelletier, druggist, Three Rivers, Que.
" 25	" McArthur, Corneille & Co., Montreal.	13765	18988	42·25	17·74	" ..	" ..	.....	"	R. W. Williams, druggist, Three Rivers, Que.
" 29	" R. Heron & Co., Montreal....	13766	18989	43·73	17·52	" ..	" ..	.....	"	A. A. Gingras, grocer, 55 Dominique, Que.
" 29	" W. Brunet & Co., Quebec.....	13769	18992	46·10	16·82	" ..	" ..	.....	"	J. B. Morin, druggist, 325 St. Joseph, Que.
" 30	" Pure Gold Co., Toronto..... <i>Official Analyst, Dr. F. X. Valade, Ottawa.</i>	13770	18993	46·40	16·28	" ..	" ..	.....	"	E. Remillard, grocer, Quebec.
Jan. 9	Borax.....	14806	20546	47·09	15·96	.....	.....	Faint trace of magnesia.	Good ..	Skinner & Co., druggist, Ottawa.
" 9	"	14807	20547	47·19	16·12	.....	.....	" ..	"	Graham & Elliott "
" 9	"	14808	20548	46·06	16·58	.....	.....	" ..	"	F. X. Conwell, grocer, Division St., Ottawa.
" 9	" Hamilton Coffee & Spice Co....	14809	20549	45·85	17·05	.....	.....	" ..	"	Hand & Phillips, grocers, cor. Somerset and Division, Ottawa.

"	29	"	Oriental Co., 33 Front St. E., Toronto.	14810	20560	43·29	17·21	"	"	"	Baldwin Bros., grocers, Nicholas St., Ottawa.
<i>Official Analyst, F. T. Harrison, London, Ont.</i>												
Jan.	17	Borax,	J. A. Kennedy, druggist, London, Ont.	14298	19434	47·32	15·03	None.	.....	Slightly adulterated; alumina, 1·40; sulphuric acid, 2·91.	Frank Hyde, druggist, Woodstock, Ont.
"	17	"	A. Ramsay & Son, Montreal.	14299	19436	47·25	16·47	Trace.	None.	Unadulterated.	John Holmes, hardware merchant-Woodstock, Ont.	
"	17	"	Gorman & Eckart, Spice Manufacturers, London, O.	14300	19438	46·15	16·17	None.	"	"	Kyan & Russell, grocers, 670 Richmond St., London, Ont.	
"	17	"	"	14311	19439	45·13	17·27	"	"	"	John Deprose, grocer, 50 Dundas St., London, Ont.	
"	18	"	"	14302	19441	47·23	16·47	"	"	"	F. H. Laing, druggist, Windsor, Ont.	
<i>Official Analyst, Dr. W. H. Ellis, Toronto.</i>												
Jan.	22	Borax,	Kerry, Watson & Co., Toronto	16058	20555	45·70	16·28	"	"	Genuine.	F. H. Lutz, druggist, Gananoque.	
"	22	"	Dingman & Co., Toronto.	16059	20556	42·40	17·66	"	"	"	Dept. Store Co., grocers, Gananoque	
"	23	"	Not known.	16060	20557	38·80	18·58	"	"	"	Taylor & McKim "	
"	24	"	"	16061	20558	41·30	17·81	"	"	"	D. L. Thompson, druggist, 394 Yonge St., Toronto.	
"	24	"	"	16062	20559	34·30	19·97	"	"	"	M. Short, grocer, Toronto.	
Feb.	6	"	" Pure Gold Co., Toronto.	16063	20566	46·00	16·58	"	"	"	J. Macolm, grocer, Spadina Avenue, Toronto.	
"	6	"	The Oriental Co., Front St., Toronto.	16064	20567	27·27	19·34	13·80	19·44	Adulterated	W. J. Sykes, grocer, College St., Toronto.	
<i>Official Analyst, Prof. E. B. Kenrick, Winnipeg.</i>												
Jan.	22	Borax,	The Bole Drug Co., Winnipeg.	17009	17302	44·81	16·92	None.	"	Genuine.	J. Vallen & Co., druggist, Winnipeg	
"	22	"	The Martin, Bole, Wynne Co., Winnipeg.	17010	17303	45·22	16·77	"	"	"	R. Dixon "	
"	25	"	Nicholson & Brock, Toronto.	17015	17308	47·11	16·25	"	"	"	W. R. Johnson, grocer "	
"	25	"	Pugsley, Dingman & Co., Toronto.	17016	17309	46·27	16·55	"	"	"	T. E. Weldon & Co. "	
<i>Official Analyst, Dr. C. J. Eagan, Victoria, B.C.</i>												
Feb.	14	Borax,	Henderson Bros., Victoria	16968	21547	46·8	16·7	"	"	"	M. J. Thompson, grocer, Victoria, B.C.	
"	14	"	Lynan, Son & Co., Montreal	16969	21550	47·1	16·9	.....	"	"	D. E. Campbell, druggist, Victoria, B.C.
"	16	"	Gorman, Eckart & Co., London, Ont.	16970	21555	47·2	16·7	.....	"	"	John Charters, grocer, Vancouver.
"	16	"	The Gold Manufacturing Co., Montreal.	16971	21557	47·2	16·9	.....	"	"	H. W. Carlson "

APPENDIX J.—INSPECTION OF

Date of Collection.	Description of Sample, together with Name and Address of Manufacturer when known.	No. of Analyst's Certificate.	No. of Sample.	RESULT OF						
				Specific Gravity at 15.5° C.	Total Solids in 100 CC.	Character of Solids.	Ash in 100 CC.	Reaction of Ash.	Total free Acidity in 100 CC.	
									As Glacial Acetic Acid.	As Acetic Anhydride.
1901.	<i>Official Analyst, Dr. M. Fiset, Quebec.</i>			p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.
Feb. 12	Pickles in vinegar, Montreal Canning Co.	13789	19774	1.0390	5.84	Dark.....	4.64	Alkaline..	1.58	1.34
" 13	Pickles in vinegar, Eureka Pickle Works, Montreal.	13790	19775	1.01995	2.71	"	2.22	" ..	1.61	1.36
" 14	Vinegar, Robitaille & Co., Montreal.	13791	19776	1.00835	0.16	Not charred.	0.03	" ..	5.07	4.31
" 15	Vinegar, M. Lefebvre & Co., Montreal.	13792	19777	1.01252	0.33	Dark.....	0.05	" ..	8.13	6.91
" 15	Vinegar, Theo. Lefebvre & Co., Montreal.	13793	19778	1.00619	0.13	Not charred.	0.02	" ..	3.81	3.24
" 22	Vinegar, Canada Vinegar Co., Montreal.	13794	19779	1.01196	0.67	" ..	0.05	" ..	6.18	5.25
" 22	Pickles in vinegar, St. Eustache Canning Co.	13795	19780	1.03734	4.99	Dark....	3.79	" ..	4.16	3.53
" 27	Vinegar, Bollmans Imported..	13796	19781	1.01197	0.16	"	0.05	" ..	7.74	6.58
" 28	Pickles in vinegar, T. A. Lytle & Co., Toronto.	13797	19782	1.03431	5.00	"	3.44	" ..	2.17	1.85
" 28	Pickles in vinegar, Canada Pickling Co., Toronto.	13798	19783	1.02006	2.63	Nearly black.	1.90	" ..	2.50	2.12
	<i>Official Analyst, Dr. F. X. Valade, Ottawa.</i>									
March 6	Vinegar furnished by Bate & Co.	14832	20575	1.0058	0.29	Brown and dry.	0.05	Very alkaline.	4.38	3.72
" 6	Vinegar (proof), Lytle, Badgerow, Wilson & Co., Toronto.	14833	20576	1.0094	0.24	Pale brown and dry.	0.03	" ..	6.48	5.51
" 6	Vinegar (x white) Lytle, Badgerow, Wilson & Co., Toronto.	14834	20577	1.0053	0.24	Brown and dry.	0.02	" ..	4.08	3.47
" 6	Vinegar (English malt), Sir John Burnett, London, Eng.	14835	20578	1.0124	2.06	Brown soft and sticky	0.20	Sl. alka...	4.44	3.77
" 6	Vinegar (malt), Crosse & Blackwell, England.	14836	20579	1.0110	2.01	Brown and dry.	0.22	Very alkaline.	4.20	3.57
" 6	Pickles in vinegar, T. A. Lytle & Co., Toronto.	14837	20580	1.0303	4.73	" ..	3.17	Alkaline..	2.16	1.84
" 6	Pickles in vinegar, Canada Pickling Co., Toronto.	14838	20581	1.0179	2.41	Pale brown and dry.	1.26	Sl. alka...	2.22	1.89
" 6	Pickles in vinegar, Crosse & Blackwell, England.	14839	20582	1.0608	9.77	" ..	7.23	Alkaline..	3.12	2.65
" 6	Pickles in vinegar, Toronto Fruit Vinegar Co.	14840	20583	1.0327	5.17	Brown and dry.	2.64	Sl. alka...	2.28	1.94
	<i>Official Analyst, Dr. W. H. Ellis, Toronto.</i>									
Feb. 6	Vinegar, Wilson, Lytle & Badgerow, Toronto.	16065	20561	1.0092	0.35	Charred ..	0.02	Alkaline..	5.27	4.63
" 6	Vinegar, not known.....	16066	20562	1.0067	0.18	" ..	0.02	" ..	4.44	3.90
" 6	Vinegar (malt) Maconachie, London, England.	16067	20563	1.0155	0.20	" ..	0.05	" ..	4.27	3.74
" 7	Vinegar.	16068	20264	1.0078	0.19	" ..	0.04	" ..	4.46	3.91
" 7	"	16069	20565	1.0069	0.19	" ..	0.04	" ..	5.02	4.40

SESSIONAL PAPER No. 14

VINEGAR—Tabulated Statement.

ANALYSIS.				Remarks by Analyst.	Name and Address of Vendor o Sample.
Grammes, H_2SO_4 in 100 CC.	Alcohol in 100 CC. by weight.	Heavy Metals.	Empyreumatic Substances by Permanganate Test.		
p. c.	p. c.	p. c.			
0.194	...	Iron and a little lead.	0.60	Low in acetic acid and contains lead.	H. Delisle, 214 St. Charles Barommé, Montreal.
.....	.....	"	0.25	"	P. Brunneau, 70 St. Lawrence, Montreal.
.....	.....	"	0.15	A little below the B. P. stand- ard in acetic acid.	E. Demers, 215 St. Charles, B. St. Montreal.
0.02	.....	.....	0.2	Genuine but contains lead.....	B. Leblanc & Co., Albert St., Hull, P.Q.
0.02	.....	Iron and a little lead.	0.1	Below B. P. standard in acetic acid ; adulterated.	Deschamp & Carrière, Bridge St., Hull, P.Q.
0.01	.....	Iron.....	0.1	Genuine.....	P. Rheault, St. Antoine St., Three Rivers, P.Q.
.....	.....	"	0.45	"	M. Lafontaine, St. Phillip St., Three Rivers, P.Q.
0.04	.....	Iron & trace of lead.	0.1	"	Arthur Rinfret, 414 St. Joseph, Quebec.
0.16	.....	"	6.0	Low in acetic acid and contains lead.	S. Martel, Champlain Market, Quebec.
.....	.....	Iron and some lead.	.....	"	L. Faucher, Champlain Market, Quebec.
None.	0.74	None.....	0.24	Below standard in acetic acid ; adulterated according to Act.	Mrs. Wm. Slattery, Ottawa East.
"	1.67	Iron and alu- mina.	0.23	Slightly under average in acetic acid ; fair sample.	G. T. Barrett, Ottawa East.
"	0.87	None.	0.22	Adulterated, being too low in acetic acid.	Hudson & Powell, Elgin St. Ottawa.
"	0.78	Iron and alu- mina.	0.6	"	"
"	0.87	"	0.55	Adulterated, too low in acetic acid.	J. Boyden, Sons & Co., Sussex St., Ottawa.
"	0.68	"	5.1	Much phosphate.....	Mrs. Wm. Slattery, Ottawa East.
"	0.47	"	1.45	"	G. T. Barrett, Ottawa East.
"	1.06	"	1.6	" and chlorides..	J. Boyden, Sons & Co., Sussex St., Ottawa.
Trace.....	0.42	"	2.3	"	Hudson & Powell, Elgin St., Ottawa.
Trace....	Trace.	Trace iron..	Less than 5 cc.	.....	S. M. Short, grocer, Spadina Avenue, Toronto.
"	"	"	"	.....	J. Malcolm, grocer, Spadina Avenue, Toronto.
0.12	"	"	"	.....	W. J. Sykes, grocer, College St., Toronto.
.....	"	"	"	.....	John Giles, grocer, Peterboro.
.....	"	"	"	.....	Geo. Carten Peterboro.

APPENDIX J.—INSPECTION OF

Date of Collection.	Description of Sample, together with Name and Address of Manufacturer when known.	No. of Analyst's Certificate.	No. of Sample.	RESULT OF						
				Specific Gravity at 15.5° C.	Total Solids in 100 CC.	Character of Solids.	Ash in 100 CC.	Reaction of Ash.	Total free Acidity in 100 CC.	
									As Glacial Acetic Acid.	As Acetic Anhydride.
1901.	<i>Official Analyst, Dr. W. H. Ellis, Toronto.—Con.</i>			p. c.	p. .	p. c.	p. c.	p. c.	p. c.	p. c.
Feb.	6 Pickles in vinegar, Thos. Hoskins, Toronto.	16070	20570	1.0346	7.18	Charred.	1.73	Alkaline.	1.71	1.50
	6 Pickles in vinegar, Crosse & Blackwell, London, Eng.	16071	20571	1.0625	11.38	"	7.25	"	3.56	3.13
	7 Pickles in vinegar, Toronto Fruit & Vinegar Co.	16072	20572	1.0390	6.22	"	4.50	"	1.71	1.50
	7 Pickles in vinegar, Heinz-Pittsburgh, N.S.	16073	20573	1.0239	3.39	"	2.03	"	3.01	2.64
	7 Pickles in vinegar, Vendor...	16074	20574	1.0658	15.32	"	0.86	"	3.09	2.71
	<i>Official Analyst, F. T. Harrison, London, Ont.</i>									
Feb.	5 Vinegar, Port Dover Vinegar Works	14303	19443	1.0130	0.405	No charr- g.	0.040	Alkaline.	7.84	6.66
	5 Pickles in vinegar, Owen Sound Pickle Co.	14304	19444	1.0117	1.160	"	0.660	"	3.24	2.75
	6 Pickles in vinegar, Williams & Son, Toronto.	14305	19445	1.0257	3.930	"	1.310	"	2.46	2.09
	6 Vinegar, S. Allen, Norwich, Ont.	14306	19446	1.0116	1.445	"	0.060	"	4.31	3.66
	7 Vinegar, Wilson, Badgerow, Lytle & Co., Toronto.	14307	19447	1.0055	1.210	"	0.025	"	4.34	3.69
	7 Pickles in vinegar, R. B. Johnson & Co., Swansea, Ont.	14308	19448	1.0220	2.900	"	1.080	"	3.53	3.00
	8 Pickles in vinegar, Canada Pickling Co., Toronto.	14309	19449	1.0226	3.035	"	1.345	"	2.89	2.45
	8 Vinegar (XX), P. E. Lumsden & Willard, Hamilton.	14310	19450	1.0069	0.188	"	0.035	"	4.15	3.53
	8 Vinegar (crab apple), Wm. Lowell, Whitby.	14311	19451	1.0182	3.025	"	0.395	"	5.06	4.30
	<i>Official Anyalst, Prof. E. B. Kenrick, Winnipeg.</i>									
April	3 Vinegar (malt), The Blackwood Co., Winnipeg.	17030	17322	1.0256	5.43	Not charred.	0.47	Alkaline.	6.11	5.19
	3 Vinegar (white wine), The Dyson Gibson Co.	17031	17323	1.0070	0.19	"	0.13	"	5.01	4.26
	4 Vinegar, The Blackwood Co..	17032	17324	1.0091	0.90	"	0.23	"	4.21	3.58
	4 Vinegar (cider), The Blackwood Co.	17033	17325	1.0174	3.34	"	0.43	"	5.25	4.46
	8 Pickles in vinegar, The Blackwood Co.	17034	17326	1.0921	24.32	"	2.38	"	2.82	2.39
	8 Vinegar (white star), The Dyson Gibson Co.	17035	17327	1.0186	3.08	"	2.18	"	2.04	1.73
	8 Vinegar (bulk), The Dyson Gibson Co.	17036	17328	1.0186	2.62	"	1.38	"	2.46	2.09
	8 Vinegar, T. A. Lytle & Co., Toronto.	17037	17329	1.0213	3.37	"	1.79	"	2.48	2.11

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VINEGAR—Tabulated Statement.

ANALYSIS.				Remarks by Analyst.	Name and Address of Vendor of Sample.
Grammes, H ₂ SO ₄ in 100 CC.	Alcohol in 100 CC. by weight.	Heavy Metals.	Empyreumatic Substances by Permanganate Test.		
p. c.	p. c.	p. c.			
0·02	"	"	More than 5·5		Wm. Morrison, grocer, 192 Queen W., Toronto.
0·12	"	"	"		Wm. Barber, grocer, 242 Queen W., Toronto.
0·14	"	"	Took 5 cc.		Geo. Carton, Peterboro'.
0·08	"	"	Not done.		Geo. H. Cooper, grocer, 250 Queen W., Toronto.
0·03	"	"	More than 5 cc.		Jas. Sutherland, Peterboro'.
Mere-est trace.	Trace.	Trace of iron	0·05	Unadulterated.	C. McIlhaizey, grocer, Stratford.
Not sufficient liquid to determine.	Not sufficient for test.	"	0·1	Pickles made with pure vinegar.	Barrisdale Trading Co., grocer, Stratford.
"	Trace.	"	1·1	Pickles made with vinegar which contains added acetic acid.	Dodge Bros., grocers, Woodstock, Ont.
Mere-est trace.	0·39	None	0·05	Unadulterated	Ulman & Lazamby, grocers, Woodstock, Ont.
"	None.	Trace of iron	0·05	"	R. Kenny, Sarnia, Ont.
0·044	Trace.	"	2·1	Pickles made with vinegar which contains added acetic acid.	Edward Kelly, grocer, Sarnia, Ont.
0·133	"	None	1·2	"	Brown Bros., grocers, 266 Dundas St., London, Ont.
Mere trace.	"	Trace of iron	0·05	Unadulterated	Geo. H. Davey, grocer, London, Ont.
"	1·60	"	0·8	Cider vinegar unadulterated	John Lawson, 261 Dundas St., London, Ont.
None	0·67		1·50	Doubtful	R. J. Gallagher & Co., Winnipeg.
"	None		1·8	Probably made from acetic acid.	F. Rosenblat, Winnipeg.
"	"		1·5	Doubtful	Philip Luhpzier.
"	0·86		1·4	"	J. R. Clements.
"	0·17		3·2	"	F. Hill.
"	0·10		1·1	"	C. Harrington & Co.
"	None.		0·7	"	Matheson Bros.
"	0·10		2·7	"	Hardy & Buchanan.

APPENDIX J.—INSPECTION OF

Date of Collection.	Description of Sample, together with Name and Address of Manufacturer when known.	No. of Analyst's Certificate.	No. of Sample.	RESULT OF						
				Specific Gravity at 15.5° C.	Total Solids in 100 CC.	Character of Solids.	Ash in 100 CC.	Reaction of Ash.	Total free Acidity in 100 CC.	
									As Glacial Acetic Acid.	As Acetic Anhydride.
				p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.
	<i>Official Analyst, Dr. Fagan, Victoria, B.C.</i>									
Feb. 26	Vinegar, John Stephens & Co., Gloucester, Eng.	16972	21560	1.007	0.2	Sl. charred	0.04	Neutral ..	4.75	4.04
" 26	Pickles in vinegar, W. Paterson, Son & Co., Brantford.	16973	21561	1.018	21.1	Not charred.	1.8	" ..	1.93	1.64
" 26	Pickles in vinegar, Côté Bros. Vinegar Co., Rochester and St. Louis, U.S.A.	16974	21562	1.011	0.52	Sl. charred	0.08	Sl. acid...	5.87	4.9
" 26	Pickles in vinegar, T. A. Lytle, Toronto.	16975	21563	1.029	6.98	" ..	1.42	Neutral .	1.43	1.2
" 26	Pickles in vinegar, Côté Bros. Vinegar Co., U.S.A.	16976	21564	1.017	1.54	" ..	0.1	" ..	8.9	7.56
" 26	Pickles in vinegar, Rowat & Co., London, Eng.	16977	21565	1.022	3.9	" ..	0.66	Alkaline..	2.62	2.22
" 26	Pickles in vinegar, not known.	16978	21566	1.017	0.87	" ..	0.06	" ..	10.13	8.61
" 26	Pickles in vinegar, B. C. Fruit Canning Co., Vancouver.	16980	21567	1.018	2.26	" ..	0.8	" ..	3.44	2.92

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VINEGAR—Tabulated Statement—*Concluded.*

ANALYSTS.				Remarks by Analyst.	Name and Address of Vendor of Sample.
Grammas, H_2SC_4 in 100 CC.	Alcohol in 100 CC. by weight.	Heavy Metals.	Emphyrenatic Substances by Permanganate Test.		
p. c.	p. c.	p. c.			
None.....	None.	None.	Took 3 cc. to colour 10 cc. of distillate	.....	Welsh & Nightingale, Vancouver, B.C.
Trace.....	Not enogh of substance	"	No substance.	.....	W. D. Muir, Vancouver, B.C.
None. ...	None.	"	5 cc. to colour 10 cc. of distill'e	.....	Wallace & Wallace, Vancouver, B.C.
"	Not enogh substance.	"	Not enogh substance	.....	J. W. Cole, Vancouver, B.C.
"	0.53	"	7 cc. to colour 10 cc. of distill'e	.....	Mrs. Fleming, Vancouver, B.C.
Trace.....	0.1	"	Not enogh substance	.....	P. H. Alder, Vancouver, B.C.
"	0.25	"	7 cc. to colour 10 cc. of distill'e	.....	W. B. Skinner, Vancouver, B.C.
Hea'y trace.	None.	"	6 cc. to colour 10 cc. of distill'e	.....	W. Clarke, Vancouver, B.C.

APPENDIX K.—INSPECTION OF

Date of Collection.	Description of Sample, together with Name and Address of Manufacturer when known.	No. of Analyst's Certificate.	No. of Sample.	RESULT			
				Specific Gravity at 15.5 C.	Iodine Absorption.	Saponification Equivalent.	Mauenné's Test.
1901.	<i>Official Analyst, Dr. M. Fiset, Quebec.</i>				p. c.		
June 3	Raw linseed oil, McCarkill, Dougall & Co., Montreal.	13811	19829	0.9322	158.06	289.3	107. c
" 3	Raw Linseed Oil, R. C. Jamieson & Co., Montreal.	13813	19831	0.9312	157.50	294.6	105.5
" 6	Raw Linseed Oil	13814	19832	0.9341	157.10	296.0	110.0
" 6	" John Shaw & Son, England	13816	19834	0.9346	157.6	299.7	110.0
" 6	" Sherwin, Williams Co.	13818	19836	0.9318	159.81	300.6	112.0
	<i>Official Analyst, Dr. F. X. Valade, Ottawa.</i>						
May 30	Raw Linseed Oil	14906	20853	0.9330	169.5	. . . . .	172.5c
" 30	"	14907	20854	0.9327	175.5	. . . . .	135. c
June 5	"	14908	20855	0.9333	173.0	. . . . .	130. c
" 5	"	14909	20856	0.9338	172.0	. . . . .	130. c
	<i>Official Analyst, Dr. W. H. Ellis, Toronto.</i>						
May 6	Raw Linseed Oil, Livingston, Baden, Ont.	16101	20857	0.9335	174.7	. . . . .	106. c
" 6	"	16102	20858	0.9329	171.2	. . . . .	111. c
" 6	Livingston, Baden, Ont.	16103	20859	0.9311	174.3	. . . . .	109. c
" 5	"	16104	20861	0.9332	174.1	. . . . .	112. c
	<i>Official Analyst, F. T. Harrison, London, Ont.</i>						
" 3	" J. J. Livingston, Baden, Ont	14345	19493	0.933	159.2	. . . . .	. . . . .
" 4	" Jas. Robertson, Paint and Oil Merchant.	14346	19494	0.934	158.7	. . . . .	. . . . .
" 5	" Robert Lewes	14349	19496	0.9335	157.6	. . . . .	. . . . .
" 5	"	14350	19498	0.933	158.0	. . . . .	. . . . .
	<i>Official Analyst, Prof. E. B. Kenrick, Winnipeg.</i>						
June 4	Raw Linseed Oil, G. T. Stephens & Co., Winnipeg.	17050	17334	0.9340	172.2	. . . . .	. . . . .
" 4	" " "	17051	17335	0.9320	170.5	. . . . .	. . . . .

SESSIONAL PAPER No. 14

LINSEED OIL—Tabulated Statement.

OF ANALYSIS.					Remarks by Analyst.	Name and Address of Vendor of Sample.
Soluble in Oil of Turpentine.	Dries to Hard Varnish.	Congeals at.	Soluble in 90 per cent Alcohol.	Appearance.		
				Dark yel-low.	Genuine	J. Denis, 236 St. Lawrence, Montreal. (Hardware and Paint Merchant.)
				Yellow	"	J. H. Wilson, 1874 Notre Dame, Mont'l. (Hardware.)
				Brown	"	Lajeunesse & Frère, 773 Valier St., Quebec. (Hardware and Paint Merchant.)
				"	"	C. A. Parent, St. Joseph St., Quebec. (Hardware.)
				Dark yel-low.	"	J. Sullivan, Main St. (Painter) Richmond.
Small proportions.	5 days.	20° 5c			Genuine	J. Skinner & Co., Ottawa.
"	4½ "	20° c			"	Joseph Archambault, (Oil and Colour Merchant), Ottawa.
"	5 "	22° c			"	W. Madill, Druggist, Peterboro.
"	5 "	20° c			"	Peterboro Hardware Co.
Complete.		20° c	Incomplete.		Genuine	Elliott & Co., Wholesale Druggists, Front St., Toronto.
"		15° c	"		"	Russell & Co., Hardware, King St., Toronto.
		20° c	"		"	The Harris Co., Ltd., King St., Toronto.
		20° c	"		"	Kingan Hardware Co., Peterboro.
					It fairly corresponds to the tests and characters outlined in the B.P.	McCurday Bros., Hardware, Stratford.
					It has considerable sediment, possibly drawn off from last of barrel, otherwise it fairly corresponds to the tests of B.P. Unadulterated.	Nevent, Clinton & Baxter, Hardware, Windsor, Ont.
					It fairly corresponds to the tests of B.P. Unadulterated.	Wm. Scarrow, Paint and Oil Merchant, London, Ont.
					" "	Jas. Cowan & Co., Hardware, London, Ont.
					Genuine	Graham & Rolston, Hardware, Winnipeg.
					"	R. Wyatt, Hardware, Winnipeg

APPENDIX K—INSPECTION OF

Date of Collection.		Description of Sample, together with Name and Address of Manufacturer when known.	No. of Analyst's Certificate.	No. of Sample.	RESULT			
					Specific Gravity at 15·5 C.	Iodine Absorption.	Saponification Equivalent.	Maumene's Test.
1901.		<i>Official Analyst, Prof. E. B. Kenrick, Winnipeg.—Con.</i>				p. c.		
May	4	Raw Linseed Oil, Body & Noakes, Linseed Winnipeg. Oil Mills.	17052	17336	0·9346	179·6	.....	.....
"	4	" Union Oil and Cake Mills, Rotherhithe, Eng.	17053	17337	0·9341	173·0	....	.....
		<i>Official Analyst, Dr. C. J. Fagan, Victoria, B C.</i>						
Jun	4	Raw Linseed Oil.. .. .	16985	21580	0·932	142·8	.....	.....
"	4	" Pilcher Co., London, Eng.	16986	21581	0·925	142·1	.....	.....
"	5	"	16987	21583	0·934	142·	.....	.....
"	5	" P. D. Dodds, Montreal...	16988	21584	0·935	143	.....	.....

SESSIONAL PAPER No. 14
LINSEED OIL—Tabulated Statement—*Concluded.*

OF ANALYSIS.					Remarks by Analyst.	Name and Address of Vendor of Sample.
Soluble in Oil of Turpentine.	Dries to Hard Varnish.	Congeals at.	Soluble in 90 per cent Alcohol.	Appearance.		
					Genuine.	J. H. Ashdown, Hardware, Winnipeg.
					"	G. T. Stephens & Co., Oils and Paints, Winnipeg.
Soluble.....			$\frac{1}{2}$ cc. in 10 cc.	Sl. turbid & yellow.	Spread on glass did not dry in 7 days. Dried in 12 hours at 100°c. Genuine.	Johnson & McPhail, Vancouver.
"			1 cc. in 10 cc.	" ..	Spread on glass dried in 7 days. Dried in 12 hours at 100°c. Genuine.	Vancouver Hardware Co.
"			$\frac{1}{2}$ cc. in 10 cc.	Yellow & clear.	" ..	S. Shore, Victoria.
"			0.2 cc. in 10 cc.	Dk. yellow & clear.	" ..	Nicholls & Renouf, Victoria.

APPENDIX L.

BULLETIN No. 74.—MILK, 1900.

OTTAWA, February 8, 1901.

E. MIALL, Esq.,
Commissioner of Inland Revenue.

SIR,—Appended to the present report will be found a tabulated statement, giving the results of examining 131 samples of milk which, in accordance with your instructions, were collected in various towns of the Dominion where, so far as could be ascertained by the food inspectors, no regular system of milk inspection had been instituted by the municipal authorities. The samples were obtained during November and December, last year, and the number collected in each town was as follows :—

Nova Scotia—	
Sydney, C.B.....	3
Antigonish.....	3
New Glasgow.....	3
Windsor.....	3
New Brunswick—	
Sussex.....	3
Newcastle.....	3
Bathurst.....	3
Campbellton.....	3
Quebec—	
Three Rivers.....	5
Sherbrooke.....	6
Magog.....	2
Lévis.....	4
St. Hyacinthe.....	7
Ontario—	
Ottawa.....	12
Brockville.....	8
Cobourg.....	6
Orillia.....	8
Kingston.....	6
Cornwall.....	4
Exeter.....	3
Clinton.....	3
Waterloo.....	3
St. Marys.....	3
Glencoe.....	1
Aylmer.....	2
Simcoe.....	4
Seaforth.....	2
Manitoba—	
Portage la Prairie.....	3
Carberry.....	3
Regina.....	3
Indian Head.....	3
Brandon.....	3
Deloraine.....	3
Total.....	131

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It will be observed from the table that in these analyses the percentage of ash has been determined, and that a new column has been added under 'analysis,' headed 'other solids.' This simply gives the non-fatty solids, less the ash. In view of their importance in forming an opinion regarding a sample, two special columns are added giving the percentage of 'total solids' and 'non-fatty solids.'

The opinions expressed by the district analysts regarding the milks will be found in the table. Of 131 samples, 104 or 79·4 per cent have been pronounced 'genuine' or 'unadulterated,' but some of these are abnormally rich in cream. When the amount of butter fat is almost as high as the 'non-fatty' solids, it is scarcely possible to regard the sample as genuine. Whether such richness is owing to carelessness in taking the sample or design on the part of the vendor must remain undecided. It is to be regretted that some of the analysts have not been sufficiently systematic in using the right expressions for their judgments, because this makes a comparison with former reports impossible. At p. 2 of Bulletin No. 43, an attempt was made to give a certain degree of definiteness to the expressions used by the analysts, and it would be well if this matter were to receive better consideration at their hands.

No addition of potassium-bichromate was made to any of the samples at the time of collection, and in consequence many of them were received in a state unfit for analysis. The addition was avoided in order to give the analysts an opportunity of searching for preservatives. It will be observed that no evidence was obtained of the use of anything of the sort. In this laboratory special care was taken to test for boracic acid, the method employed being essentially that described in Allen's Organic Analysis, Vol. IV., p. 176. Methyl alcohol was, however, substituted for ordinary alcohol, because, with the former, the greenish flame colour is more distinctly observed when boracic acid is present. Twenty to twenty-five grammes of milk were usually operated on, and in no case did the ash show any indication of the presence of boracic acid. After making the test, 1 cc of a 0·2 per cent solution of anhydrous borax, was frequently introduced into the capsule, when the presence of boracic acid was found to be distinctly recognisable. Even when this quantity is introduced into twenty grammes milk and evaporated and incinerated with it, the admixture can be detected. One cc of a 0·2 per cent solution of anhydrous borax in 20 grammes milk is equal to 0·0135 per cent of boracic acid. Since the usual addition for preserving purposes is said to be 35 grains of boracic acid per gallon of milk, or 0·05 per cent on the latter, it is evident that the above mentioned test is quite sufficient for its detection.

I beg to recommend the publication of the report, and

I have the honour to be, sir,

Your obedient servant,

THOMAS MACFARLANE,

Chief Analyst.

Results of the Examination of 131 Samples of Milk.

Date of Collection.	No. of Sample.	Name and Address of Vendor.	Sp. Gr. at 15° C.	Acidity—C ₁₂ Soda- required to neutral- ise 10 cc Milk.	ANALYSIS.				Total Solids.	Non-fatty Solids.	Preservatives.	Remarks by Analysts.	
					Ash.	Butter Fat.	Other Solids.	Water.					
1900.													
Nov.	27	20009 B. Fulton	1·0328	1·26	0·80	3·77	7·63	87·80	12·20	8·43	.....	Genuine.
"	27	20010 E. P. Richardson	1·0226	0·92	0·77	3·84	7·71	87·68	12·32	8·48	.....	Watered and therefore adulter- ated according to the Act.
"	27	20011 H. C. Archibald	1·0328	1·46	0·55	2·93	5·51	91·01	8·99	6·06	.....	Genuine.
					0·56	3·03	5·33	91·08	8·92	5·89	No boracic acid.		
					0·75	4·20	7·98	87·07	12·93	8·73	.....	Genuine.
					0·80	4·12	7·75	88·05	11·95	7·90	No boracic acid.		
Antigonish, N.S.													
"	29	20012 Jos. Jocelyn	1·0333	1·23	0·80	4·12	7·75	87·33	12·67	8·55	.....	"
"	29	20013 F. R. Trotter	1·0338	1·44	0·75	4·12	7·85	87·28	12·72	8·60	No boracic acid.	"	
"	29	20014 W. J. Landry	1·0350	1·85	0·77	5·70	8·56	84·97	15·08	9·38	.....	"
					0·77	6·50	8·60	84·13	15·87	9·37	No boracic acid.		
					0·71	3·73	8·43	87·13	12·87	9·14	.....	"
					0·71	3·86	8·64	86·79	13·21	9·35	No boracic acid.		
New Glasgow, N.S.													
"	30	20015 J. F. Morrow	1·0341	1·28	0·72	4·48	8·38	86·42	13·58	9·10	.....	"
"	30	20016 N. W. Mason	1·0322	1·23	0·73	4·54	8·43	86·30	13·70	9·16	No boracic acid.	"	
"	30	20017 Fraser Bros.	1·0334	1·28	0·74	4·23	7·76	87·27	12·73	8·50	.....	"
					0·71	4·17	7·99	87·13	12·87	8·70	No boracic acid.		
					0·74	4·18	8·04	87·04	12·96	8·78	.....	"
					0·71	4·09	7·95	87·25	12·75	8·66	No boracic acid.		
Windsor, N.S.													
Dec.	4	20018 T. H. Curry	1·0326	1·23	0·73	4·00	8·21	87·06	12·94	8·94	.....	"
"	5	20019 Wm. Seary	1·0328	1·13	0·67	4·00	8·18	87·15	12·85	8·85	No boracic acid.	"	
"	5	20020 W.C.T.U. Luncheon	1·0330	1·33	0·75	4·80	8·30	86·15	13·85	9·05	.....	"
					0·71	4·88	8·22	86·19	13·81	8·93	No boracic acid.	"	
					0·77	4·20	8·00	87·03	12·97	8·77	.....	"
					0·73	5·24	7·88	86·15	13·85	8·61	No boracic acid.	"	

Nov.	19	17744	Sussex Milk Co.....	1·0336	1·33	0·77 0·66	4·08 3·82	7·96 8·72	87·19 86·80	12·81 13·20	8·73 9·38	No formaldehyde nor boracic acid.	Genuine.
"	19	17745	"	1·0334	1·36	0·74 0·60	3·74 3·52	7·65 8·84	87·87 87·04	12·13 12·96	8·39 9·44	No formaldehyde nor boracic acid.	"
"	19	17746	"	1·0296	1·23	0·74 0·59	6·16 6·08	7·28 7·82	85·82 85·51	14·18 14·49	8·02 8·41	No formaldehyde nor boracic acid.	"
Newcastle, N.B.													
"	21	17747	Mrs. F. James	1·0330	1·28 1·50	0·75 0·70	2·82 2·26	7·52 7·43	88·91 89·61	11·09 10·39	8·27 8·13	No formaldehyde nor boracic acid.	Adulterated; deficient in solids and butter fat.
"	21	17748	Wm. Jardine	1·0343	1·44 1·60	0·81 0·67	4·88 5·16	8·35 8·52	85·96 85·65	14·04 14·35	9·16 9·19	No formaldehyde nor boracic acid.	Genuine.
"	21	17749	John McKean.....	1·0303	1·18 1·30	0·82 0·71	8·03 8·46	7·56 7·86	83·59 82·97	16·41 17·03	8·38 8·57	No formaldehyde nor boracic acid.	Abnormal in fat.
Bathurst, N.B.													
"	22	17750	Mrs. C. McGinly	1·0331	1·46 1·60	0·78 0·66	3·96 4·02	7·83 8·04	87·43 87·28	12·57 12·72	8·61 8·70	No boracic acid.	Genuine.
"	22	17751	P. P. Foley ..	1·0377	1·30 2·30	0·82 0·67	3·53 3·68	9·01 9·22	86·64 86·43	13·36 13·57	9·83 9·89	No boracic acid.	"
"	22	17752	John Kenny	1·0301	1·80 3·10	0·84 0·69	8·45 8·37	8·85 8·84	81·86 82·10	18·14 17·90	9·69 9·53	No boracic acid.	Abnormal.
Campbellton, N.B.													
"	23	17753	Thomas Duncan	1·0343	3·75	0·82	4·32	8·09	86·77	13·23	8·91	No boracic acid.	Genuine.
"	23	17754	David Doherty ..	1·0342	.....	0·67	4·16	8·40	86·77	13·23	9·07	No boracic acid.	"
"	23	17755	Jerome Peters.....	1·0333	1·26	0·77	4·51	7·95	86·77	13·23	8·72	No boracic acid.	"
				1·0333	.....	0·62	4·39	8·03	86·96	13·04	8·65	No boracic acid.	Watered, and is therefore adul-
				1·0300	1·30	0·73	3·50	7·00	88·77	11·23	7·73	No boracic acid.	terated according to the Act.
						0·57	3·47	7·06	88·90	11·10	7·63	No boracic acid.	

The first line of figures in each of the foregoing samples shows the results reported by M. Bowman, Official Analyst, Halifax, N.S.
The second line shows the analysis as made in the Inland Revenue Laboratory, Ottawa.

RESULTS of the Examination of 131 Samples of Milk—Continued.

Date of Collection.	No. of Sample.	Name and Address of Vendor.	Sp. Gr. at 15° C.	Acidity—Ce ₁₀ ^N Soda required to neutralize 10 cc Milk.	ANALYSIS.				Total Solids.	Non-fatty Solids.	Preservatives.	Remarks by Analyst.
					Ash.	Butter Fat.	Other Solids.	Water.				
1900.		Three Rivers, Que.			p. c.	p. c.	p. c.	p. c.	p. c.	p. c.		
"	12	19702 W. Matté, Baulieu St	1.0332	1.3	0.73	3.75	8.07	87.45	12.55	8.80	None	Genuine.
"	12	19703 P. Gouin, Baulieu St	1.0333	1.3	0.62	3.60	8.20	87.58	12.42	8.82	"	"
"	12	19704 A. E. Leblanc, St. Roch St.	1.0316	1.2	0.74	4.02	7.74	87.50	12.50	8.48	"	"
"	12	19705 Armond Beaudry, St. Mar- guerite St.	1.0320	1.1	0.62	3.83	8.01	87.54	12.46	8.63	"	"
"	12	19706 Theo. Beaudry	1.0347	1.8	0.82	4.67	8.61	85.90	14.10	9.43	"	"
"	12	19707 E. A. Little, Lennoxville St.	1.0342	1.6	0.71	4.63	8.88	85.78	14.22	9.59	"	"
"	12	19708 W. S. Armitage, Ascot St.	1.0329	1.6	0.76	3.96	7.89	87.39	12.61	8.65	"	"
"	12	19709 J. Lacombe, Orford St	1.0326	1.5	0.66	3.78	8.12	87.44	12.56	8.78	"	"
"	12	19710 P. Vaillancourt, Albertine St.	1.0330	1.4	0.76	4.00	8.29	86.95	13.05	9.05	"	"
"	12	19711 David Lefebvre, Montreal Road.	1.0338	1.3	0.60	3.80	8.53	87.02	12.98	9.18	"	"
"	15	19712 G. Fortier, Brook St	1.0292	1.2	0.70	3.35	6.98	88.97	11.03	7.68	"	Watered, being low in butter fat and other solids; adulterated
"	15	19713 E. J. Merry, farmer	1.0272	1.4	0.56	3.22	7.02	89.20	10.80	7.58	"	Genuine.
"	15	19714 A. D. Rogers	1.0324	1.7	0.80	4.09	7.97	87.14	12.86	8.77	"	"
"	15	19715 Achille Currier	1.0313	1.7	0.69	4.02	8.19	87.10	12.90	8.88	"	"
"	15	19716 J. Lacombe, Orford St	1.0329	1.7	0.81	4.64	8.27	86.28	13.72	9.08	"	"
"	15	19717 P. Vaillancourt, Albertine St.	1.0334	2.	0.70	4.55	8.43	86.32	13.68	9.13	"	"
"	15	19718 David Lefebvre, Montreal Road.	1.0324	1.5	0.77	3.94	8.19	87.10	12.90	8.96	"	"
"	15	19719 G. Fortier, Brook St	1.0327	1.5	0.73	3.91	8.10	87.26	12.74	8.83	"	"
"	15	19720 E. J. Merry, farmer	1.0318	1.4	0.78	4.17	7.72	87.33	12.67	8.50	"	"
"	15	19721 A. D. Rogers	1.0320	1.4	0.60	4.05	7.97	87.38	12.62	8.57	"	"
"	15	19722 G. Fortier, Brook St	1.0323	1.5	0.79	3.86	7.80	87.55	12.45	8.59	"	"
"	15	19723 G. Fortier, Brook St	1.0326	1.4	0.73	3.69	7.88	87.70	12.30	8.61	"	"
"	15	19724 E. J. Merry, farmer	1.0310	1.5	0.67	4.10	7.63	87.60	12.40	8.30	"	"
"	15	19725 Achille Currier	1.0327	1.6	0.81	4.45	8.06	86.68	13.32	8.87	"	"
"	15	19726 Achille Currier	1.0330	1.4	0.69	4.39	7.24	87.68	12.32	7.93	"	"
"	15	19727 Achille Currier	1.0314	1.6	0.74	4.09	7.77	87.40	12.60	8.51	"	"
"	15	19728 Achille Currier	1.0310	1.5	0.67	4.10	7.63	87.60	12.40	8.30	"	"
"	16	19729 Achille Currier	1.0316	1.5	0.75	4.33	7.84	87.05	12.92	8.59	"	"
"	16	19730 Achille Currier	1.0322	1.5	0.65	4.09	8.33	86.93	13.07	8.98	"	"

"	16	19716	Arthur Hall, Village Sarris-teau.	1·0327	1·4	0·80	4·82	8·06	86·32	13·68	8·86	"	.....
"	16	19717	Louis Babin, Village Sarris-teau.	1·0323	.....	0·66	4·55	8·41	86·38	13·62	9·07	"	.....
"	16	19718	Eug. Currier, Notre Dame de Lévis.	1·0328	1·5	0·77	4·11	8·02	87·10	12·90	8·79	"	.....
"	16	19719	Eug. Currier, Notre Dame de Lévis.	1·0333	.....	0·58	3·82	8·40	87·20	12·80	8·98	"	.....
"	16	19720	Eug. Currier, Notre Dame de Lévis.	1·0329	1·6	0·74	4·18	8·20	86·88	13·12	8·94	"	.....
"	16	19721	Eug. Currier, Notre Dame de Lévis.	1·0334	.....	0·56	3·87	8·49	87·08	12·92	9·05	"	.....
<i>St. Hyacinthe, Que.</i>													
Nov.	17	19719	Xavier Blain, Casade St. ...	1·0339	1·7	0·82	5·11	8·41	85·66	14·34	9·23	"	.....
"	17	19720	L. Marchesault, St. Joseph St.	1·0334	.....	0·62	4·70	8·77	85·91	14·09	9·39	"	.....
"	17	19721	Ambrose Chenet, St. Pierre St.	1·0335	1·7	0·80	4·42	7·93	86·85	13·15	8·73	"	.....
"	17	19722	J. B. Lemieux, St. Rosali.	1·0335	.....	0·66	3·98	8·35	87·01	12·99	9·01	"	.....
"	17	19723	Louis Currier, St. Casimir.	1·0320	1·8	0·83	5·12	8·26	85·79	14·21	9·09	"	.....
"	17	19724	E. Clapin, St. Dominique.	1·0328	.....	0·64	4·70	8·65	86·01	13·99	9·29	"	.....
"	17	19725	B. Lalonde, St. Athanet.	1·0339	1·7	0·73	5·06	8·21	86·00	14·00	8·94	"	.....
"	17	19726	C. Traffin	1·0327	.....	0·60	5·01	8·01	86·38	13·62	8·61	"	.....
"	17	19727	C. Traffin	1·0341	1·6	0·80	4·23	8·21	86·76	13·24	9·01	"	.....
"	17	19728	C. Traffin	1·0337	.....	0·65	4·07	8·33	86·95	13·05	8·98	"	.....
"	17	19729	C. Traffin	1·0321	1·6	0·77	4·70	7·71	86·82	13·18	8·48	"	.....
"	17	19730	C. Traffin	1·0357	.....	0·71	4·48	7·35	87·46	12·54	8·06	"	.....
"	17	19731	C. Traffin	1·0342	1·6	0·79	4·90	8·50	85·81	14·19	9·29	"	.....
"	17	19732	C. Traffin	1·0327	.....	0·68	4·71	8·27	86·34	13·66	8·05	"	.....

The first line in each of the foregoing samples shows the results reported by Dr. M. Fiset, Official Analyst, Quebec.
The second line shows the analysis by Mr. A. L. Trenchard, Inland Revenue Laboratory, Ottawa, who also tested the whole of the samples for formaldehyde and boracic acid without finding any.

Nov.	12	20518	J. J. Clarke.	1·0399	1·8	0·74	5·20	7·64	86·42	13·58	8·38	None	Genuine.
"	12	20519	W. Warnock.	1·0335	1·5	0·43	4·83	8·77	85·97	14·03	9·20	"	Under average in solids not fat.
"	12	20520	G. B. Dowler	1·0274	1·6	0·66	5·32	7·16	86·86	13·14	7·82	"	Under average in solids not fat.
"	12	20521	E. Johnston	1·0335	1·	0·55	5·15	7·64	86·66	13·34	8·19	"	Genuine.
"	12	20522	H. N. Mather.	1·0311	1·35	0·72	3·98	7·90	87·40	12·60	8·62	"	Genuine.
"	12	20523	Bell Bros.	1·0325	1·4	0·59	3·86	8·18	87·37	12·63	8·77	"	"
"	12	20524	John Firth.	1·0289	1·55	0·65	3·70	7·58	88·07	11·93	8·23	"	"
"	12	20525	G. Dowler.	1·0314	1·4	0·57	3·66	7·77	88·00	12·00	8·34	"	"
"	12	20526	C. Traffin	1·0308	1·83	0·71	4·77	8·03	86·49	13·51	8·74	"	"
"	12	20527	C. Traffin	1·0331	1·4	0·65	4·52	8·49	86·34	13·66	9·14	"	"
"	12	20528	C. Traffin	1·0326	1·95	0·67	4·47	7·91	86·95	13·05	8·58	"	"
"	12	20529	C. Traffin	1·0329	1·4	0·64	4·27	8·37	86·72	13·28	9·01	"	"
"	13	20530	C. Traffin	1·0293	1·84	0·66	4·80	7·54	87·00	13·00	8·20	"	Slightly under average in solids not fat, but rich in fat.
"	13	20531	C. Traffin	1·0324	1·5	0·62	4·20	8·20	86·98	13·02	8·82	"	Genuine.
"	13	20532	C. Traffin	1·0315	1·63	0·68	3·84	8·08	87·40	12·60	8·76	"	"
"	13	20533	C. Traffin	1·0344	1·8	0·65	3·59	8·46	87·30	12·70	9·11	"	"
"	13	20534	C. Traffin	1·0292	1·45	0·73	4·31	7·68	87·28	12·72	8·41	"	"
"	13	20535	C. Traffin	1·0336	1·4	0·61	4·06	8·21	87·12	12·88	8·82	"	"

RESULTS of the Examination of 131 Samples of Milk—Continued.

Date of Collection.	No. of Sample.	Name and Address of Vendor.	Sp. Gr. at 15° C.	Activity—Cc $\frac{1}{10}$ Soda required to neutralize 10 cc Milk.	ANALYSIS.				Total Solids.	Non-fatty Solids.	Preservatives.	Remarks by Analysts.
					Ash.	Butter Fat.	Other Solids.	Water.				
					p. c.	p. c.	p. c.	p. c.	p. c.	p. c.		
1900		Ottawa—Con.										
Nov. 13	20527	E. Caldwell.....	1·0327	1·6	0·74	4·03	7·94	87·29	12·71	8·68	None.....	Genuine.
"	13	20528 I. H. Heron.....	1·0363	1·3	0·65	3·74	8·44	87·17	12·83	9·09	"	"
"	13	20529 J. M. Fulford.....	1·0305	1·5	0·75	4·61	8·19	86·45	13·55	8·94	"	"
"	13	20529 J. M. Fulford.....	1·0325	1·5	0·67	4·08	8·24	87·01	12·99	8·91	"	Under average in solids not fat.
"	13	20529 J. M. Fulford.....	1·0269	1·30	0·63	3·67	7·06	88·64	11·36	7·69	"	"
"	13	20529 J. M. Fulford.....	1·0294	1·5	0·63	3·61	7·21	88·55	11·45	7·84	"	"
		Brockville.										
"	16	20530 J. McCrea ..	1·0330	2·1	0·75	4·67	7·99	86·59	13·41	8·74	"	Genuine, rich in fat.
"	16	20531 H. N. Crippin..	1·0325	1·9	0·64	4·53	8·19	86·64	13·36	8·83	"	"
"	16	20532 Josh. Morrison ..	1·0310	1·5	0·73	3·79	8·05	87·43	12·57	8·78	"	"
"	16	20533 Row & Son.....	1·0326	1·4	0·67	3·64	8·29	87·40	12·60	8·96	"	"
"	16	20534 J. W. Newman.....	1·0317	1·45	0·71	4·44	8·28	86·57	13·43	8·99	"	"
"	16	20535 F. Billings.....	1·0318	1·2	0·69	4·55	8·11	86·65	13·35	8·80	"	over average in fat.
"	16	20536 M. Fitzpatrick.....	1·0323	1·55	0·77	5·51	8·40	85·32	14·68	9·17	"	"
"	16	20537 J. Berringer.....	1·0328	1·5	0·75	5·52	8·70	85·03	14·97	9·45	"	"
"	16	20538 J. Berringer.....	1·0333	2·35	0·75	4·60	7·75	86·99	13·10	8·50	"	"
"	16	20539 F. Billings.....	1·0290	1·6	0·57	4·72	8·56	86·15	13·85	9·13	"	"
"	16	20540 M. Fitzpatrick.....	1·0306	1·8	0·75	4·79	7·61	86·85	13·15	8·36	"	"
"	16	20541 J. Berringer.....	1·0305	1·5	0·58	4·28	8·25	86·89	13·11	8·83	"	"
"	16	20542 J. Berringer.....	1·0305	1·5	0·77	4·38	7·82	87·03	12·97	8·59	"	"
"	16	20543 J. Berringer.....	1·0305	1·5	0·59	3·94	8·41	87·06	12·94	9·00	"	rich in fat.
"	16	20544 J. Berringer.....	1·0305	1·5	0·72	4·60	7·63	87·05	12·95	8·35	"	"
"	16	20545 J. Berringer.....	1·0305	1·5	0·60	4·11	8·11	87·18	12·82	8·71	"	"

The first line in each of the foregoing samples shows the results reported by Dr. R. X. Valade, Official Analyst, Ottawa.
The second line shows the analysis by Mr. A. L. Touchot, Inland Revenue Laboratory, Ottawa. Mr. Touchot tested these samples also for formaldehyde, but was unable to obtain any evidence of its presence. Neither could he detect any boracic acid in them.

RESULTS of the Examination of 131 Samples of Milk—Continued.

Date of Collection.	No. of Sample.	Name and Address of Vendor.	Sp. Gr. at 15° C.	Acidity—Ce $\frac{1}{10}$ Soda required to neutralize 10 cc Milk.	ANALYSIS.				Total Solids.	Non-fatty Solids.	Preservatives.	Remarks by Analyst.
					Ash.	Butter Fat.	Other Solids.	Water.				
					p. c.	p. c.	p. c.	p. c.	p. c.	p. c.		
1900.		Kingston, Ont.										
Dec.	1	19742 P. E. Ward, Portsmouth .	1·0340	1·42	0·75	3·34	7·75	88·16	11·84	8·50	.....	Below average in total solids.
"	1	19743 J. Abbott, Montreal Road.	1·0340	1·77	0·70	3·26	7·76	88·28	11·72	8·46	No boracic acid.	Unadulterated.
"	1	19744 Henry Rees, York Road .	1·0340	1·56	0·80	5·42	8·58	85·20	14·80	9·38	.....	"
"	1	19745 Thos. O'Connor, Catarquai.	1·0340	1·92	0·73	3·54	7·70	88·03	11·97	8·43	No boracic acid.	"
"	1	19746 H. Theriault, Concession St.	1·0335	1·51	0·66	3·56	7·79	87·99	12·01	8·45	No boracic acid.	"
"	1	19747 Monk Bros., Pittsburgh...	1·0335	1·56	0·73	3·79	8·00	87·48	12·52	8·73	.....	"
		Cornwall, Ont.			0·69	3·79	8·10	87·42	12·58	8·79	No boracic acid.	"
"	4	19748 G. H. Brosen, farmer.....	1·0315	1·51	0·80	4·60	8·05	86·55	13·45	8·85	.....	"
"	4	19749 Herman Kirk.....	1·0340	1·72	0·71	4·53	8·12	86·64	13·36	8·83	No boracic acid.	"
"	4	19750 D. W. Clark, Front St.....	1·0335	1·62	0·81	3·95	8·14	87·10	12·90	8·95	.....	"
"	4	19751 Jas. Howden, Centre Road.	1·0330	2·02	0·71	4·07	8·18	87·04	12·96	8·89	No boracic acid.	"
"	4	19748 G. H. Brosen, farmer.....	1·0315	1·51	0·70	4·32	7·98	87·00	13·00	8·68	.....	"
"	4	19749 Herman Kirk.....	1·0340	1·72	0·68	4·20	7·77	87·35	12·65	8·45	No boracic acid.	"
"	4	19750 D. W. Clark, Front St.....	1·0335	1·62	0·76	4·32	8·38	86·54	13·46	9·14	.....	"
"	4	19751 Jas. Howden, Centre Road.	1·0330	2·02	0·70	4·22	8·41	86·67	13·33	9·11	No boracic acid.	"
					0·75	3·82	8·25	87·18	12·82	9·00	.....	"
"	4	19748 G. H. Brosen, farmer.....	1·0315	1·51	0·73	3·74	8·15	87·38	12·62	8·88	No boracic acid.	"
"	4	19749 Herman Kirk.....	1·0340	1·72	0·77	4·76	8·51	85·96	14·04	9·28	.....	"
"	4	19750 D. W. Clark, Front St.....	1·0335	1·62	0·76	4·75	8·31	86·18	13·82	9·07	No boracic acid.	"

The first line in each of the foregoing samples shows the results reported by Dr. W. H. Ellis, Official Analyst, Toronto.
The second line shows the analyses by T. Macfarlane, Ottawa.

Date of Collection.	No. of Sample.	Name and Address of Vendor.	Sp. Gr. at 15° C.	Acidity—Ce ¹ / ₁₀ Soda required to neutralize 10 cc Milk.	ANALYSIS.				Total Solids.	Non-fatty Solids.	Preservatives.	Remarks by Analyst.
					Ash.	Butter Fat.	Other Solids.	Water.				
Nov. 16	19403	John McInnis.....	1·0320	6·9	0·66	5·74	6·36	87·24	12·76	7·02	None.	Under average in non-fatty solids.
"	16	19404 W. H. Dearing	Sample thick.	8·0	0·70	3·21	8·38	87·71	12·29	9·08	"	Genuine.

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"	16	19405	A. Dow.....	" ..	8·0	0·63	3·67	8·48	87·22	12·78	9·11	None.....	Genuine.
			Clinton, Ont.			0·68	3·89	7·94	87·49	12·51	8·62		
"	17	19406	Adam Weir..	1·0334	3·8	0·65	3·90	7·57	87·88	12·12	8·22	"	"
"	17	19407	Thos. J. Kemp.....	1·0311	4·1	0·62	3·23	7·96	88·19	11·81	8·58	"	"
"	17	19408	Benj. Churchill.....	1·0316	5·6	0·64	6·40	7·23	85·73	14·27	7·87	"	Genuine; very rich in butter fat.
			Waterloo, Ont.			0·71	5·23	7·95	86·11	13·89	8·66	"	
						0·58	4·62	7·79	87·01	12·99	8·37	"	Genuine.
						0·66	4·41	7·65	87·28	12·72	8·31	"	"
"	19	19409	E. E. Huehn.....	1·0297	2·0	0·60	6·23	6·44	86·73	13·27	7·04	"	Under average in non-fatty solids.
"	19	19410	Hy. Stroh.....	1·0314	4·3	0·58	4·43	7·83	87·16	12·84	8·41	"	Coagulated.
"	19	19411	Hy. Grein	Sample thick.	8·3	0·56	5·87	7·14	86·43	13·57	7·70	"	Genuine; rich in butter fat.
			St. Marys, Ont.			0·61	2·44	9·23	87·72	12·28	9·84	"	Coagulated.
						0·54	3·53	8·26	87·67	12·33	8·80	"	Genuine.
						0·68	3·64	7·80	87·88	12·12	8·48	"	Coagulated.
"	20	19412	Wm. Pearin.....	1·0319	1·5	0·61	5·62	6·20	87·57	12·43	6·81	"	[watered.
"	20	19413	Josh Meagher.....	1·0322	1·7	0·69	3·59	8·23	87·49	12·51	8·92	"	Very rich milk. Probably slightly
"	20	19414	Henderson & Billings.	1·0313	1·5	0·62	3·40	9·13	86·85	13·15	9·75	"	Coagulated.
			Glencoe, Ont.			0·64	3·42	7·39	88·55	11·45	8·03	"	Genuine.
						0·58	6·36	6·10	86·96	13·04	6·68	"	Coagulated.
												"	Very rich milk. Probably slightly
"	21	19415	Peter Gardner.....	1·0305	3·0	0·56	5·16	7·20	87·08	12·92	7·76	"	watered.
			Aylmer, Ont.			0·65	4·48	8·10	86·77	13·23	8·75	"	Under average in non-fatty
												"	solids.
"	22	19416	H. Draper.....	1·0277	1·7	0·59	5·97	5·38	88·06	11·94	5·97	None.....	Very rich milk—probably slightly
"	22	19417	V. J. McClennan.....	1·0290	1·6	0·67	3·71	7·58	88·04	11·96	8·25	"	watered.
			Simcoe, Ont.			0·62	6·16	6·61	86·61	13·39	7·23	"	Under average in non-fatty
						0·64	4·98	7·72	86·66	13·34	8·36	"	solids.
"	23	19418	E. H. Widmer.....	1·0300	1·5	0·64	4·66	8·54	86·16	13·84	9·18	"	Genuine.
"	23	19419	J. H. Woolley.....	1·0299	6·3	0·69	4·70	7·12	87·49	12·51	7·81	"	Coagulated.
"	23	19420	W. J. Kydd.....	1·0315	6·5	0·54	3·42	8·10	87·94	12·06	8·64	"	Genuine.
"	23	19421	E. C. Smith	1·0288	1·7	0·68	3·38	10·82	85·12	14·88	11·50	"	Coagulated.
						0·65	3·73	8·49	87·13	12·87	9·14	"	Genuine.
						0·71	3·38	7·41	88·50	11·50	8·12	"	Coagulated.
						0·68	7·54	6·86	84·92	15·08	7·54	"	Partly cream.
						0·70	5·52	7·41	86·37	13·63	8·11	"	Coagulated.

RESULTS of the Examination of 131 Samples of Milk—Concluded.

Date of Collection.	No. of Sample.	Name and Address of Vendor.	Sp. Gr. at 15° C.	Acidity—C ₁₀ Soda required to neutralize 10cc Milk.	ANALYSIS.				Total Solids.	Non-fatty Solids.	Preservatives.	Remarks by Analyst.
					Ash.	Butter Fat.	Other Solids.	Water.				
1900.					p. c.	p. c.	p. c.	p. c.	p. c.	p. c.		
Nov. 26	19422	Jas. B. Sproat	1·0329	7·1	0·58	4·44	8·36	86·62	13·38	8·94	None	Genuine.
"	26	19423 Jas. Dinnie	1·0317	1·6	0·78	4·18	8·32	86·72	13·28	9·10	"	"
					0·68	3·86	8·03	87·43	12·57	8·71	"	"
					0·73	3·55	8·13	87·59	12·41	8·86	"	"

The first line in each of the foregoing samples shows the results reported by E. T. Harrison, Official Analyst, London, Ont. The second line shows the results obtained in the Inland Revenue Laboratory, Ottawa, chiefly by Mr. A. L. Touchot, who analysed samples 19403 to 19417, inclusive, and found them all free from boric acid. He also tested Nos. 19403 to 19417 for formaldehyde, finding none. The analyses of Nos. 19422 and 19423 are by T. Macfarlane, who found them free from boric acid.

1900.		Portage la Prairie, Man.										Sample delayed by Dominion Express Co., and received in an unfit state for analysis.
Nov. 20	17284	Andrew Kirk	1·0324	1·5	0·75	9·87	8·44	80·94	19·06	9·19	.....	"
"	20	17285 John Hannah	1·0324	1·5	0·57	10·07	8·24	81·12	18·88	8·81	No formaldehyde nor boric acid.	"
"	20	17286 Mrs. W. C. Kaake	1·0324	1·7	0·74	5·23	7·48	86·55	13·45	8·22	.....	"
		Carberry, Man.			0·52	4·63	8·33	86·52	13·48	8·85	No formaldehyde nor boric acid.	"
					0·75	5·17	8·57	85·51	14·49	9·32	.....	"
					0·62	4·78	8·86	85·74	14·26	9·48	No formaldehyde nor boric acid.	"
"	21	17287 W. Atkin	1·0333	1·88	0·75	4·51	8·54	86·20	13·80	9·29	.....	Genuine.
"	21	17288 E. H. Cope	1·0328	1·66	0·56	4·19	8·08	87·17	12·83	8·64	No boric acid.	"
"	21	17289 Mrs. W. R. Clarke	1·0324	1·89	0·75	3·87	7·70	87·75	12·25	8·38	No boric acid.	"
		Regina, Man.			0·68	3·77	8·28	87·20	12·80	9·03	.....	"
					0·64	3·06	7·87	88·43	11·57	8·51	No boric acid.	"
"	22	17290 Geo. Brodder	1·0320	1·67	0·74	3·54	7·96	87·76	12·24	8·70	"
					0·57	3·27	7·84	88·32	11·68	8·41	No boric acid.	"

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"	22	17291	Thomas Watson	1.0334	1.61	0.77	4.82	8.51	85.90	14.10	9.28 No boracic acid.	"
"	22	17292	Mrs. A. Bannister	1.0334	0.64	4.57	8.47	86.32	13.68	9.11 No boracic acid.	Partly skimmed and therefore adulterated according to Act.
			<i>Indian Head, Man.</i>	1.0336	1.64	0.73	3.05	8.31	87.91	12.09	9.04	..... No boracic acid.	
				1.034	.....	0.63	3.15	8.36	87.86	12.14	8.99	..... No boracic acid.	
"	23	17293	Wm. Fraser	1.0352	1.83	0.76	4.82	8.97	85.45	14.55	9.73	..... No boracic acid.	Genuine.
"	23	17294	Mrs. S. B. Copithorn	1.035	.....	0.65	4.58	9.12	85.65	14.35	9.77	..... No boracic acid.	"
"	23	17295	J. Harris Benbow	1.0331	1.85	0.77	3.92	8.28	87.03	12.97	9.05	..... No boracic acid.	"
				1.034	.....	0.60	3.45	8.69	87.26	12.74	9.29	..... No boracic acid.	"
				1.0359	1.84	0.80	4.31	9.03	85.86	14.14	9.83	..... No boracic acid.	"
				1.034	.....	0.49	4.31	9.20	86.00	14.00	9.69	..... No boracic acid.	
1900.			<i>Brandon, Man.</i>										
Nov.	24	17296	Andrew Mutter	1.0317	1.66	0.73	3.75	7.77	87.75	12.25	8.50	..... No boracic acid.	Below average, probably watered.
"	24	17297	Alex. Neilly . . . . .	.....	.....	0.73	3.72	7.75	87.80	12.20	8.48	..... No boracic acid.	
"	24	17298	J. B. Noble	1.0320	1.75	0.73	4.48	8.14	86.65	13.35	8.87	..... No boracic acid.	Genuine.
				.....	.....	0.79	4.36	7.98	86.87	13.13	8.77	..... No boracic acid.	"
				1.0326	1.82	0.70	4.62	8.35	86.33	13.67	9.05	..... No boracic acid.	"
			<i>Deloraine, Man.</i>	... ..	.....	0.75	4.52	8.23	86.50	13.50	8.98	..... No boracic acid.	
"	25	17299	Mrs. A. Cassels	1.0324	1.70	0.72	4.48	8.25	86.55	13.45	8.97	..... No boracic acid.	"
"	25	17300	Mrs. James Shanks . . . .	.....	.....	0.74	4.03	8.43	86.80	13.20	9.17	..... No boracic acid.	"
"	25	17301	Mrs. N. E. Chapin	1.0321	1.74	0.69	4.62	8.22	86.47	13.53	8.91	..... No boracic acid.	"
				.....	.....	0.74	4.00	8.19	87.07	12.93	8.93	..... No boracic acid.	"
				1.0314	1.63	0.75	5.81	8.20	85.24	14.76	8.95	..... No boracic acid.	"
				.....	.....	0.79	5.44	8.33	85.44	14.56	9.12	..... No boracic acid.	"

The first line in each of the foregoing samples shows the results reported by Prof. E. B. Kenrick, Official Analyst, Winnipeg.
The second line shows the results obtained in the Inland Revenue Laboratory, Ottawa.

APPENDIX M.

BULLETIN No. 75.—FERTILIZERS.

OTTAWA, May 13, 1901.

E. MIALL, Esq.,
Commissioner of Inland Revenue.

SIR,—I beg to submit herewith two tabulated statements: No. I., describing the standard samples of the fertilizers which, in accordance with the provisions of the Fertilizers Act, have been furnished to the Department by their manufacturers, importers or vendors, and No. II., containing the results of analysing the samples of fertilizers which have been collected as sold in the open market during the present year.

The number of samples described in Table I. is slightly below that for 1900, and much less than that of the two previous years.

In 1897 there were analysed 107 standard samples.			
" 1898	"	124	"
" 1899	"	154	"
" 1900	"	107	"
" 1901	"	102	"

The decrease is mainly in the samples sent from the United States, where it is said that measures have been taken to confine their fertilizer trade in Canada to a smaller number of manufacturers. With reference to the standard samples, as given in Table I., it will be observed that as a rule two lines of figures are given opposite the description of each sample; the upper line gives the quantities of fertilizing constituents guaranteed by the manufacturers, and the lower line the results of the analysis in this Branch. The fourth column in the table states the materials from which the different fertilizers were manufactured in all cases where the information has been supplied. The column headed 'Relative value per ton of 2,000 pounds, gives the value of each fertilizer based upon the following prices for the fertilizing constituents:—

	Cents per pound.
Nitrogen in salts of ammonia or nitrates.....	13
Organic nitrogen in ground bone, fish, blood or tannage.....	12
Phosphoric acid, soluble in water.....	6
" soluble in 1 p.c. citric acid.....	5½
" insoluble in ground bone or tannage.....	5
" insoluble in 'Thomas' phosphate powder.....	3½
" insoluble in ground rock phosphate or in compound fertilizers..	1½
Potash contained in wood ashes.....	6
" in high grade potash salts.....	5¼

It is to be observed with regard to the "fertilizers as sold" described in Table II., in which the date of the collection and the names of the vendors and manufacturers are given, that, in most cases, there are three lines of figures opposite the description of each sample. The uppermost of these shows the contents guaranteed by the manufacturer: the next lower line gives the percentage of fertilizing constituents found in the standard sample submitted to the department and the lowest line gives the same percentages found in the sample collected. In cases where no samples have been submitted, and nevertheless, in contravention of the Fertilizers Act, the fertilizers have been offered for sale, the two upper lines will of course show no figures.

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According to the opinions expressed by the analysts, out of 65 samples collected none have been found to be adulterated and only 4 defective or not quite up to guarantee. Eleven samples were illegally sold, not having been registered.

No objection has been taken to any of the samples of basic slag or Thomas phosphate powder, regarding which so much discussion took place last year. It will be observed that none of the samples of it mentioned in Table II. have been characterized as "adulterated under the Act." Since these samples were of the same nature as those of 1900, it will be necessary to explain the cause of this different finding and to relate the history of the question of "available" phosphoric acid from the point up to which it was given in last year's Bulletin (No. 70, p. 7.) By a reference to the latter it will be seen that the Agricultural Committee of the House of Commons adopted the amendment which the minister of Inland Revenue proposed to incorporate in the Bill brought in by Mr. James Domville, M.P., to amend the Fertilizers Act. Nevertheless, on account of the abandonment of Mr. Domville's Bill, no change in the Fertilizers Act was made, and the prospect was opened up of a continuation of the disagreement between the department and manufacturers or importers of basic slag.

Under these circumstances I proposed to you that the whole matter should be referred to the council and members of the Society of Public Analysts in London for such action as they might see fit to take, and I was authorized to open a correspondence with the secretaries of said Society with the view of obtaining a distinct expression of opinion regarding the analysis of basic slag and other fertilizers. Having, during the course of my leave of absence last year, had occasion to be in London, England, I took the opportunity of entering into communication, verbally and otherwise, with several members of the council of the Society of Public Analysts and with the secretaries. To the latter I addressed a letter dated 25th June, 1900, which was considered at a meeting of the council and a sub-committee was appointed to consider its subject. Dr. Dyer, however, wrote me that it was impossible to arrange for a meeting of this committee in July, and the matter had, therefore, to stand over until after the recess. It was not until the 16th of October that the sub-committee held a meeting, at which the proceedings, as communicated by the secretaries, were as follows :—

" EXTRACT OF MINUTES ; SUB-COMMITTEE MEETING.

‘ Tuesday, Oct. 16, 1900.

‘ The President in the chair.

‘ Present : Dr. Dyer, Dr. Voelcker, Mr. Voelcker and Mr. Chapman.

‘ A letter was read from Mr. Smetham to Dr. Dyer in which he detailed his views on the subject of Mr. Macfarlane's proposal. After some discussion it was resolved that :—The committee, having very carefully considered the proposal of Mr. Macfarlane, as stated in his letter of June 25, and the documents referring to it, do not see their way to recommend the council to take steps in the direction either of laying down standards or of prescribing arbitrary methods for the analysis of fertilizers.

‘ With regard to the subject more especially dealt with in Mr. Macfarlane's report, (Bulletin No. 70) the Committee do not make any recommendation in reference to the formulation of an official process for the estimation of "available" phosphoric acid in basic slag or other fertilizers. The Committee are however unanimously of opinion that the ammonium citrate process, which is at present officially used in the United States of America, while affording a useful means for the approximative determination of "reverted" phosphates in superphosphates, dissolved bones and similar acid manures, is nevertheless in no sense an adequate means of measuring the amount of available phosphate that does not happen to have gone through the processes of solution and reversion.

‘ The Committee are further of opinion that the citrate of ammonium process is wholly inapplicable to the analysis of basic slag, and that if any process of analysis is to be used for distinguishing between *total* and *available* phosphate in that manure, it must be an acid process, and one proceeding on some such lines as the present process of Professor Wagner."

While in London I also took the opportunity of calling on the firm named H. & E. Alberts Chemical Works, from whom the supply of Thomas Phosphate Powder, which was imported into Canada had been obtained. I did this for the purpose of discussing fully with the manager of the firm the position of the question as set forth in Bulletin No. 70 pp. 5, 6 and 7, and in order to explain to them the reasons why their wish could not be complied with, that the Wagner method of determining the available phosphoric acid in basic slag should be adopted in this laboratory. In these discussions my arguments were mainly founded on the position taken under paragraph 5 on page 6 of Bulletin No. 70 which reads as follows:—‘To apply a two per cent citric acid solution for determining the available phosphoric acid in Thomas Phosphate Powder, and not to the water-insoluble part of other fertilizers, would be a course calculated to occasion strong objections on the part of the fertilizer manufacturers of this country and of the United States.’ Besides defending the position taken by this Branch, and also by the Agricultural Committee of the House of Commons, I also suggested a plan by which *all* fertilizers could be tested by exactly the same method without doing any injustice to the Thomas Phosphate Powder or basic slag. This consisted (after the removal of the soluble phosphoric acid, when present, by water) in boiling the water-insoluble residue, or, in the case of basic slag, the powdered sample direct with a strong solution of ammonium chloride, so as to remove any free lime which the sample might contain, and after this to determine the available phosphoric acid by a one per cent solution of citric acid as recommended by Dr. Bernard Dyer. The latter part of the plan is justified in an elaborate paper by that gentleman entitled ‘On the analytical determination of probably available mineral plant food in soils,’ and published in the Journal of the Chemical Society Vol. LXV., from which the following important conclusion may be quoted:—‘A one per cent citric acid solution appears, then, to give indications fairly bearing out the manurial properties of phosphatic materials as recognized by experience in the field; it approximates fairly well to the average strength of the natural solvent (root-sap) used by the plant itself; and tested by the result it gives on soils of known history and condition, it appears likely to afford a not unreliable means of gauging, as regards the available mineral constituents the probable fertility of the soil itself.’ I endeavoured to explain the advantages of the method here indicated to the representatives of the Albert firm in London, but they suggested that I should visit their works at Biebrich on the Rhine and explain it to Mr. Heinrich Albert and also to Professor Dr. Wagner at Darmstadt. This I accordingly did, with the result that both gentlemen received me with much courtesy, exhibited much interest in my suggestions, and engaged to investigate their value.

In October, 1900, after my return to Canada, I caused some trials to be made in this laboratory by Mr. A. L. Tournet on basic slag, using the processes above described. These experiments proved that about 8 per cent of lime were removed by the ammonium chloride solution and that this occasioned an increase of nearly 4 per cent in the citrate soluble or available phosphoric acid as determined by the ordinary official citrate of ammonia method. When, in treating the residue from 2 grammes of the sample, 200 c.c. of a 1 per cent citric acid solution is substituted, for the 100 c.c. of a 20 per cent solution of citrate of ammonia, and allowed to act in the cold for half an hour with moderate agitation, the increase in the available phosphoric acid is about the same.

These experiments were described in detail in a memorandum which I prepared for the meeting of the Association of official agricultural chemists which was held at Washington, on November 16, 1900. I attended this meeting, pressed the subject of my memorandum on the consideration of those present, and endeavoured to represent that it deserved investigation at the hands of the Association. I also submitted a draft of the changes I proposed, of which the following is a copy:—

Memorandum of proposed alterations in the analysis of fertilizers to be made in the official method under (3) ‘Determination of Phosphoric Acid,’ (4) and (5) on p. 13 of ‘Methods of Analysis as adopted by the Association of Official Agricultural Chemists being Bulletin 46 U.S. Department of Agriculture.’

(4) Citric insoluble phosphoric acid.

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(a) In acidulated samples—Introduce the filter containing the washed residue, deprived of water-soluble phosphoric acid, from two grammes of the original sample into a flask with 100 cc of 1 per cent citric acid solution, stopper tightly and shake violently until the filter paper is reduced to a pulp. Add 100 cc additional of the 1 per cent citric acid solution and digest at room temperature for half an hour, shaking the flasks thoroughly every five minutes. With four analyses in hand this means an agitation of one minute duration repeated six times. Filter and wash thoroughly. Dry and transfer the filter and its contents to a crucible, ignite until all organic matter is destroyed, add from 10 to 15 cc of strong nitric or hydrochloric acid and digest until all phosphate is dissolved. Dilute the solution to 200 cc, mix well, filter through a dry filter and proceed as under total phosphoric acid.

(b) In non-acidulated samples—In case a determination of citric insoluble phosphoric acid is required in non-acidulated samples, such as basic slag, Thomas phosphate powder, ground bone, bone char, bone ash, it is to be made by taking two grammes of the phosphatic material (without previous washing with water) and introducing it into a flask with 100 cc of a 5 per cent solution of ammonium chloride and boiling it for thirty minutes, replacing always the evaporated water, then filtering and washing the residue and treating it, exactly as above described with 1 per cent citric acid solution, determining the phosphoric acid in the residue.

(5) Citric Soluble Phosphoric Acid—The sum of the water-soluble and the citric-insoluble phosphoric acid subtracted from the total gives the citric-soluble phosphoric acid.

The sum of the latter and the water-soluble phosphoric acid is to be regarded as 'available phosphoric acid.'

After discussing my proposals, the Association voted that they should be submitted to the committee on recommendations for consideration and report. A similar decision was arrived at concerning a motion to permit Wagner's 2 per cent citric acid method to be used provisionally on basic slag until such time as the Association could arrive at a final conclusion. Subsequently, the committee reported in favour of submitting my proposals to the referee on fertilizers for further investigation, but declining to recommend the use of Wagner's process even temporarily. It will thus be seen that no decided action is to be expected on this subject by the Association until next November.

After my return from Washington, I requested Mr. McGill to undertake an investigation of the matter, which he did very thoroughly. His report is quite voluminous and is appended to this communication. On the whole it confirms the advisability of adopting the changes above referred to. The following extracts have special reference to these changes :—

' III. In basic slags a 5 per cent solution of ammonium chloride forms an effective solvent for the free lime, and does not dissolve phosphoric acid.'

' IV. Citric acid of 1 per cent strength is practically as efficient a solvent of phosphoric acid as a 2 per cent solution for lime-free slags.'

On January 4 last, I submitted to you a report regarding the condition of this question at that date. The Association of Official Agricultural Chemists had not had time to investigate the proposed changes, and the Society of Public Analysts in England had declined to make any positive recommendation. The English committee condemned the United States official method for determining 'available' phosphoric acid other than 'reverted,' and favoured one resembling Wagner's, while the United States Association declined to sanction the use of the latter, even temporarily. At the same time the necessity existed for coming to a conclusion regarding the methods to be used during the present year. I therefore applied to you to sanction the adoption in this laboratory of the methods proposed by me at once, and also for permission to request the district analysts to modify their treatment of fertilizer samples accordingly, beginning on February 1. This action received your approval, and has been in operation since the date mentioned.

It will be observed that, in both the tables of results of analysis now submitted, the old column heading under 'phosphoric acid' which used to read 'Reverted or citrate

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soluble' has been changed to 'citric soluble,' which indicates the percentage of phosphoric acid soluble in a 1 per cent solution of citric acid. This percentage added to that of the water-soluble phosphoric acid is stated in another column as that of 'available' phosphoric acid. The general result of the alteration made in the analytical methods is slightly to increase the quantity of available phosphoric acid, not only in basic slag, but also in other fertilizers, and especially in those made from bone, and it would appear that in this way their practical agricultural effect is more closely indicated.

In conclusion I have to recommend the publication of this report with accompanying tables, as well as Mr. McGill's report, and also the memoranda on manures, which it has been customary to append to the fertilizer bulletins for some years past.

I have the honour to be, sir,

Your obedient servant,

THOMAS MACFARLANE,

Chief Analyst.

TABLE I.

TABLE I.—Statement of the Results of Examining 102 Standard

Number of Sample.	Name of Manufacturer.	By whom sent.	From what Materials Produced.	Name or Brand of Fertilizer.
1148	Russia Cement Co., Gloucester, Mass.	S. C. Shaffner, Clementsport, N.S.		'Essex Complete Manure for Potatoes, Roots and Vegetables'— Guaranteed. Found.
1149	Imported.	M. J. Henry, Vancouver, B.C.		'Muriate of Potash'— Guaranteed. Found.
1150	Fraser River Oil & Guano Syndicate.	T. Watts, Manager Vancouver.		'Fish Guano'— Guaranteed. Found.
1151	Palmerston Pork Pkg. Co., Ltd.	Manufacturers	Blood, bones and general packing house refuse.	'Tankage'— Guaranteed. Found.
1152	The Standard Fertilizer and Chemical Co., Ltd., Smith's Falls Ont.	"	From mineral phosphate of lime.	'Superphosphate of Lime'— Guaranteed. Found.
1153	" "	"		'Special Fertilizer'— Guaranteed. Found.
1154	" "	"	Made from nitrate of soda, sulphate of ammonia, potash and magnesia salts, mineral superphosphate, bone char and fine bone meal.	'No. 1 Fertilizer'— Guaranteed. Found.
1155	" "	"		'Standard Fertilizer'— Guaranteed. Found.
1156	" "	"		'Corn and Grass Fertilizer'— Guaranteed. Found.
1157	" "	"		'Royal Fertilizer'— Guaranteed. Found.
1158	" "	"	"	'Bone Meal'— Guaranteed. Found.
1159	" "	"		'Nitrate of Soda'— Guaranteed. Found.
1160	Bowker Fertilizer Co., 43 Chatham St., Boston Mass.	"	Made from bone, bone black, phosphatic guano, bone phosphates, dried blood, meat or fish, sulphate of ammonia or nitrate of soda, sulphate of potash or muriate of potash and sulphuric acid.	'Bowkers' Potato and Vegetable Fertilizer'— Guaranteed. Found.
1161	" "	"		'Bowkers' Square Brand Bone and Potash Fertilizer'— Guaranteed. Found.
1162	" "	"		'Bowkers' Farm and Garden Fertilizer'— Guaranteed. Found.
1163	" "	"		'Bowkers' Vermont Fertilizer'— Guaranteed. Found.
1164	" "	"		'Bowkers' Ground Bone'— Guaranteed. Found.

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Samples of Commercial Fertilizers, registered for 1901.

RESULTS OF ANALYSIS.										Number of Samples.
Nitrogen.		Phosphoric Acid.					Potash.	Moist- ure.	Relative Value per Ton of 2,000 lbs.	
Total, including that of Nitric Acid or Ammonia, if present.	Total calculated as Ammonia.	Soluble in Water.	Citric Soluble.	In- soluble.	Total.	Total Avail- able.				
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	\$ cts.	
3·70 3·98	4·50 4·83	3·00 5·57	4·00 4·03	2·00 2·37	9·00 11·97	7·00 9·60	8·50 9·46	..... 5·50	26 40 31 30	1148
.....	.....	.....	.....	.....	.....	.....	50·40	5·58	52 92	1149
5·95 5·76	7·22 6·99	..... 0·64	..... 4·93	..... 3·52	9·08 9·09	..... 5·57	..... 0·43	22·57 20·30	..... 23 98	1150
6·45 5·92	7·82 7·19	Trace. 0·77	3·83 6·14	7·87 5·57	11·70 12·48	3·83 6·91	0·17 0·20	..... 5·68	27 74 27 67	1151
.....	.....	.....	.....	.....	16·00 16·95	14·00 14·40	.....	.....	.....	1152
.....	.....	12·66	1·74	2·55	.....	.....	.....	6·65	17 87	.....
.....	3·50 3·82	..... 6·22	..... 3·06	..... 1·50	10·00 10·87	8·00 9·28	6·00 7·48	..... 7·20	..... 26 69	1153
.....	2·00 2·92	..... 6·51	..... 3·27	..... 2·30	11·00 12·10	9·00 9·78	1·00 1·21	..... 5·70	..... 19 23	1154
.....	2·50 2·95	..... 6·07	..... 3·48	..... 2·55	11·00 12·10	9·00 9·55	2·00 2·42	..... 7·05	..... 21 29	1155
.....	2·00 3·37	..... 6·85	..... 2·88	..... 1·15	9·00 10·88	7·00 9·73	4·00 5·74	..... 5·02	..... 24 91	1156
.....	2·00 3·43	..... 7·04	..... 3·32	..... 0·64	9·00 11·00	8·00 10·36	3·00 3·79	..... 6·12	..... 23 32	1157
.....	5·00 5·34	..... .....	..... 15·35	..... 7·36	..... 22·71	23·00 15·35	..... .....	..... 4·42	..... 34 80	1158
.....	19·00 19·67	..... .....	..... .....	..... .....	..... .....	..... .....	..... .....	..... 0·46	..... 38 92	1159
.....	2·00 2·43	..... 4·40	..... 5·00	..... 2·30	11·00 11·70	9·00 9·40	2·00 2·14	..... 6·15	..... 19 04	1160
.....	2·00 2·52	..... 2·05	..... 6·97	..... 3·38	12·00 12·40	6·00 9·02	2·00 2·66	..... 3·45	..... 18 52	1161
.....	2·00 2·68	..... 4·28	..... 4·84	..... 2·58	10·00 11·70	8·00 9·12	2·00 2·95	..... 5·50	..... 19 62	1162
.....	3·00 3·21	..... 8·00	..... 1·53	..... 0·92	10·00 10·45	8·00 9·53	4·00 4·26	..... 7·00	..... 22 73	1163
.....	3·00 2·75	..... .....	..... 14·70	..... 8·00	24·00 22·70	..... 14·70	..... .....	..... 3·85	..... 31 86	1164

TABLE I.—Statement of the Results of Examining 102 Standard

Number of Sample.	Name of Manufacturer.	By whom sent.	From what Materials Produced.	Name of Brand of Fertilizer.
1165	The Laing Packing and Provision Co., Ltd., Montreal.	Manufacturers. ...	Dried tankage and bones from hogs.	'Tankage'— Guaranteed..... Found.....
1166	Ingersoll Packing Co., Ingersoll Ont.	"	Blood, tankage and bone from the hog.	'Ingersoll Fertilizer'— Guaranteed
1167	The Wm. Davies Co., Ltd., Toronto.	"	Dried blood, bone and meaty matter.	Found
1168	The Nichols Chemical Co., Ltd., Capelton Que.	"	Canadian apatite, Tennessee apatite, sulphate of ammonia and muriate of potash.	Fertilizer 'Exhibit A'— Guaranteed
1169	" " ..	"		Found
1170	" " ..	"		'Capelton Brand'— Guaranteed
1171	" " ..	"		Found
1172	" " ..	"		'The Royal Canadian'— Guaranteed
1173	" " ..	"		Found
1174	Provincial Chemical Fertilizer Co., Ltd., St. John N.B.	"		'The Victor'— Guaranteed
1175	" " ..	"		Found
1176	" " ..	"		'The Reliance'— Guaranteed.....
1177	" " ..	"		Found
1178	The W. A. Freeman Co., Ltd., 57 Ferguson Ave., South Hamilton Ont.	"		'No. 1 Brand'— Guaranteed
1179	" " ..	"		Found
1180	" " ..	"		'Our Crown Brand'— Guaranteed
1181	" " ..	"		Found
1182	" " ..	"		'Imperial Superphosphate'— Guaranteed
				Found
				'Potato Phosphate'— Guaranteed
				Found
				'Victor Guano'— Guaranteed
				Found
				'Bone Meal'— Guaranteed
				Found
				'Freeman's Pure Bone Meal'— Guaranteed
				Found.....
				'Freeman's Sure Growth Manure'— Guaranteed
				Found
				'Freeman's Potato Manure'— Guaranteed
				Found
				'Freeman's Bone and Potash'— Guaranteed
				Found
				'Freeman's Celery and Early Vegetable'— Guaranteed
				Found

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Samples of Commercial Fertilizers, registered for 1901.

RESULTS OF ANALYSIS.										Relative Value per Ton, of 2,000 lbs.	Number of Sample.
Nitrogen.		Phosphoric Acid.					Potash.	Moist- ure.			
Total ; including that of Nitric Acid or Ammonia, if present.	Total ; Calculated as Ammonia.	Soluble in Water.	Citric Soluble.	In- soluble.	Total.	Total Avail- able.					
p. c.	p. p.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	\$ cts.		
4·12	5·00	.....	.....	.....	14·71	.....	.....	5·52	.....	1165
4·59	5·58	.....	15·16	5·44	20·60	15·16	0·70	6·24	33 87	
.....	9·00	.....	5·50	6·80	.....	.....	.....	8·00	.....	1166
7·97	9·67	.....	10·40	0·80	11·20	10·40	0·64	8·10	32 04	
7·50	9·12	.....	.....	.....	13·60	.....	.....	7·43	.....	1167
8·13	9·87	0·50	9·22	2·48	12·20	9·72	.....	6·30	32 73	
.....	.....	.....	.....	.....	.....	8·00	.....	.....	.....	1168
.....	.....	8·20	0·90	5·10	14·20	9·10	.....	9·95	12 36	
.....	4·00	.....	.....	.....	.....	9·00	5·00	.....	.....	1169
4·06	4·94	9·30	0·62	3·08	13·00	9·92	5·23	4·90	27 99		
.....	2·00	.....	.....	.....	.....	7·00	3·00	.....	.....	1170
2·36	2·87	6·30	1·25	4·55	12·10	7·55	3·92	9·40	20 08		
.....	2·00	.....	.....	.....	.....	6·00	2·00	.....	.....	1171
2·35	2·85	5·53	1·55	4·82	11·95	7·13	2·72	5·05	18 34		
.....	.....	.....	.....	.....	.....	11·50	.....	.....	.....	1172
.....	.....	10·48	.....	4·70	15·18	10·48	.....	11·50	13 99	
.....	2·00	.....	.....	.....	.....	11·00	2·50	.....	.....	1173
2·19	2·67	10·85	1·00	3·50	15·35	11·85	3·50	6·90	24 10		
2·29	2·79	6·13	1·56	8·28	16·27	7·99	2·27	.....	19 80	1174
2·52	3·06	7·50	3·26	6·64	17·40	10·76	2·35	9·10	23 10		
2·63	3·19	6·38	1·63	6·64	14 65	8·01	5·29	.....	23 30	1175
3·30	4·01	6·97	2·57	5·86	15·40	9·54	6·49	8·25	27 68		
1·55	1·89	6·15	1·25	6·64	14·04	7·40	2·24	.....	16 79	1176
2·18	2·65	7·15	3·14	5·36	15·65	10·29	2·43	8·50	21 42		
3 59	4·35	.....	.....	.....	24·48	.....	.....	.....	.....	1177
4·85	5·90	.....	15·47	6·15	21·62	15·47	.....	6·05	34 81	
.....	3·00	.....	.....	.....	23·00	.....	.....	.....	.....	1178
3·67	4·45	0·23	13·65	8·72	22·60	13·88	.....	7·30	32 82	
.....	3·50	.....	.....	.....	8·00	.....	3·00	.....	.....	1179
3·44	4·18	6·08	2·62	1·00	9·70	8·70	5·44	2·49	24 45		
.....	3·00	.....	.....	.....	8·00	.....	5·00	.....	.....	1180
3·30	4·01	5·95	2·46	1·39	9·80	8·41	7·40	2·00	26 51		
.....	2·00	.....	.....	.....	9·00	.....	6·00	.....	.....	1181
2·03	2·46	5·95	2·48	2·32	10·75	8·43	8·47	4·17	24 38		
.....	6·00	9·00	6·00	1182	
5·86	7·24	5·48	2·22	1·45	9·15	7·70	6·97	1·55	30 83		

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TABLE I.—Statement of the Results of Examining 102 Standard

Number of Sample.	Name of Manufacturer.	By whom sent.	From what Materials Produced.	Name or Brand of Fertilizer.
1183	The W. A. Freeman Co., Ltd., 57 Ferguson Ave., South Hamilton, Ont.	Manufactures.....		'Freeman's Grass and Grain Manure'— Guaranteed..... Found.....
1184				'Freeman's Tankage Manure'— Guaranteed..... Found.....
1185				'Freeman's Tobacco Manure'— Guaranteed..... Found.....
1186				'Freeman's Phosphate Powder'— Guaranteed..... Found.....
1187	Canada Lime and Cement Co., Lake Weedon. Quebec.	" "		'Lake Weedon National Brand Fertilizer XX, for Vegetables and Gardens'— Guaranteed..... Found.....
1188	The American Agricultural Chemical Co., Bradley Fertilizer Works, Boston, Mass.	" "		'Bradley's XL Superphosphate of Lime'— Guaranteed..... Found.....
1189				'Bradley's Eclipse Phosphate'— Guaranteed..... Found.....
1190				'Bradley's Potato Fertilizer'— Guaranteed..... Found.....
1191				'Bradley's New Method Fertilizer'— Guaranteed..... Found.....
1192				'Bradley's Fine Ground Bone'— Guaranteed..... Found.....
1193				Williams & Clark's 'Corn Phosphate'— Guaranteed..... Found.....
1194				Williams & Clark's 'Potato Manure'— Guaranteed..... Found.....
1195				Williams & Clark's 'Royal Bone Phosphate'— Guaranteed..... Found.....
1196	" "	" "		'Soluble Pacific Guano'— Guaranteed..... Found.....
1197				'Pacific Potato Special'— Guaranteed..... Found.....
1198				'Pacific Nobsque Guano'— Guaranteed..... Found.....

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Samples of Commercial Fertilizers, registered for 1901—Continued.

RESULTS OF ANALYSIS.										Number of Sample.
Nitrogen.		Phosphoric Acid.					Potash.	Mois- ture.	Relative Value per Ton of 2,000 lbs.	
Total, including that of Nitric Acid or Ammonia, if present.	Total calculated as Ammonia.	Soluble in Water.	Citric Soluble.	In- soluble.	Total.	Total Avail- able.				
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	\$ cts.	
..... 2·98	2·00 3·62	..... 4·55	..... 2·28	..... 4·52	9·00 11·35	..... 6·83	1·00 3·30	..... 2·55	..... 19 93	1183
..... 7·36	5·00 8·94	..... .....	..... 10·96	..... 3·04	12·00 14·00	..... 10·96	..... .....	..... 4·70	..... 32 76	1184
..... 6·00	6·00 7·29	..... 5·80	..... 1·63	..... 0·92	7·00 8·35	..... 7·43	7·00 8·09	..... 2·55	..... 31 92	1185
..... 0·77	..... 0·94	..... 11·15	..... 1·55	..... 6·00	15·00 18·70	..... 12·70	..... 1·21	..... 4·00	..... 20 00	118
..... 1·21	0·43 1·56	..... .....	..... 6·40	..... 4·40	10·11 10·80	..... 6·40	3·21 2·80	..... 0·50	..... 14 20	1187
2·06 2·67	2·50 3·25	5·00 6·40	3·00 4·09	2·00 1·60	10·00 12·09	8·00 10·49	1·50 3·52	..... 12·08	16 41 22 77	1188
1·03 1·41	1·25 1·72	6·00 6·21	2·00 3·26	2·00 2·05	10·00 11·52	8·00 9·47	2·00 2·47	..... 15·32	14 57 17 62	1189
2·06 2·23	2·50 2·70	5·00 6·72	3·00 2·87	2·00 2·05	10·00 11·64	8·00 9·59	3·00 3·96	..... 12·76	17 99 20 92	1190
1·03 1·34	1·25 1·63	6 00 5·89	2·00 4·02	2·00 1·73	10·00 11·64	8·00 9·91	2·00 3·03	..... 15·14	14 57 18 21	1191
..... 3·72	3 00 4·52	..... .....	..... 16·63	..... 7·68	22·80 24·31	..... 16·63	..... .....	..... 5·70	..... 34 90	1192
2·06 2·48	2·50 3·01	5·00 6·46	3·00 4·74	2·00 1·28	10·00 12·48	8·00 11·20	1·50 2·16	..... 11·70	16 41 21 56	1193
2·06 2·24	2·50 2·72	5·00 6·75	3·00 2·66	2·00 2·14	10·00 11·55	8·00 9·41	3·00 4·09	..... 13·40	17 99 21 35	1194
1·03 1 26	1·25 1·53	6·00 6·50	2·00 3·14	2·00 1·66	10·00 11·30	8·00 9·64	2·00 2·66	..... 15 40	14 57 17 57	1195
2·06 2·38	2·50 2·89	5·00 6·80	3·00 3·19	2·00 1·86	10·00 11·85	8·00 9·99	1·50 2·20	..... 13·55	16 41 20 25	1196
2·06 2·17	2·50 2·63	5·00 6·50	3·00 3·12	2·00 1·88	10·00 11·50	8·00 9·62	3·00 3·46	..... 13·00	17 99 20 63	1197
1·03 1·60	1·25 1·94	6·00 6·05	2·00 3·63	2·00 1·42	10·00 11·10	8·00 9·68	2·00 2·12 14·70	14 57 17 73	1198

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TABLE I.—Statement of the Results of Examining 102 Standard

Number of Sample.	Name of Manufacturer.	By whom sent.	From what Materials Produced.	Name of Brand of Fertilizer.
1199	The American Agricultural Chemical Co., Bradley Fertilizer Works, Boston, Mass.	Manufacturers .. ..	.....	'Pacific Fine Ground Bone'— Guaranteed..... Found.....
1200	" " ..	" "	.....	'Cleveland Fertilizer for all Crops'— Guaranteed..... Found.....
1201	" " ..	" "	.....	'Quinnipiac Climax Phosphate'— Guaranteed..... Found.....
1202	" " ..	" "	.....	'Quinnipiac Mohawk Fertilizer'— Guaranteed..... Found.....
1203	" " ..	" "	.....	'Quinnipiac Potato Phosphate'— Guaranteed..... Found.....
1204	" " ..	" "	.....	'Cumberland Superphosphate'— Guaranteed..... Found.....
1205	" " ..	" "	.....	'Cumberland Potato Fertilizer'— Guaranteed..... Found.....
1206	" " ..	" "	.....	'Cumberland Fine Ground Bone'— Guaranteed..... Found.....
1207	" " ..	" "	.....	'Read's Standard'— Guaranteed..... Found.....
1208	" " ..	" "	.....	'Read's Leader'— Guaranteed..... Found.....
1209	" " ..	" "	.....	'Tucker's Imperial bone superphosphate'— Guaranteed..... Found.....
1210	Palmerston Pork Pkg. Co., Limited, Palmerston, Ont.	" "	Blood, bone and general packing house refuse.	'Tankage'— Guaranteed..... Found.....
1211	The American Agricultural Chem'l Co., Rutland, Vermont.	" "	.....	'Great Eastern General Fertilizer'— Guaranteed..... Found.....
1212	" " ..	" "	.....	'Great Eastern Potato manure Fertilizer'— Guaranteed..... Found.....
1213	" " ..	" "	.....	'Great Eastern Northern Corn Special Fertilizer'— Guaranteed..... Found.....
1214	" " ..	" "	.....	'Great Eastern Grass and Oats Fertilizer'— Guaranteed..... Found.....
1215	The Leeds Phosphate Work, Hunslet, Leeds, England.	" "	.....	'Basic Slag'— Guaranteed..... Found.....

SESSIONAL PAPER No. 14

Samples of Commercial Fertilizers, registered for 1901.—Continued.

RESULTS OF ANALYSIS.										Number of Sample.
Nitrogen.		Phosphoric Acid.					Potash.	Mois- ture.	Relative Value per Ton of 2,000 lbs.	
Total including that of Nitric Acid or Ammonia, if present.	Total calculated as Ammonia.	Soluble in Water.	Citric Soluble.	In- soluble.	Total.	Total Avail- able.				
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	\$ cts.	
... 2·88	3·00 3·51	Trace	18·98	3·42	22·80 22·40	18·98	.....	.....50	31 21	1199
1·03 1·27	1·25 1·55	6·00 5·85	2·00 3·67	2·00 1·48	10·00 11 00	8·00 9·52	2·00 1·99	..... 15·35	14 57 16 84	1200
1·03 1·34	1·25 1·63	6·00 5·81	2·00 4·24	2·00 1·25	10·00 11·30	8·00 10·05	2·00 2·49	..... 11·40	14 57 17 83	1201
0·82 1·18	1·00 1·43	5·00 2·90	2·00 5·82	1·00 2·88	8·00 11·60	7·00 8·72	1·00 1·76	..... 9·65	11 52 16 58	1202
2·06 2·13	2·50 2·58	5·00 6·60	3·00 3·22	2·00 1·88	10·00 11·70	8·00 8·48	3·00 3·75	..... 15·60	17 99 20 97	1203
2·06 2·42	2·50 2·94	5·00 6·90	3·00 3·49	2·00 1·76	10·00 12·15	8·00 8·66	1·50 2·47	..... 11·75	16 41 21 14	1204
2·06 2·16	2·50 2·62	5·00 6·90	3·00 2·69	2·00 1·76	10·00 11·35	8·00 8·66	3·00 3·61	..... 13·35	17 99 20 83	1205
... 4·61	3·00 5·59	.....	12·92	9·68	22·80 22·60	12·92	.....	5·00	35 44	1206
0·82 1·43	1·00 1·73	5·00 6·60	3·00 2·85	2·00 1·90	10·00 11 35	8·00 9·45	4·00 4·88	..... 23·84	13 97 20 17	1207
0·82 1·22	1·00 1·48	5·00 3·10	2·00 5·25	1·00 2·95	8·00 11·30	7·00 8·35	1·00 3·07	..... 11·02	11 52 15 53	1208
1·03 1·39	1·25 1·68	6·00 6·45	2·00 3·25	2·00 1·70	10·00 11·40	8·00 9·70	2·00 2·64	..... 14·72	14 57 17 93	1209
8·54	10·37	.....	5 65	1·60	7·25	5·65	2·47	8·54	30 92	1210
1·38	1·00 1·68	8·00 6·05	3·53	1·00 2·12	11·70	9·58	4·00 4·15	11·10	19 45	1211
2·15	2·50 2·62	8·00 6·60	2·81	1·00 2·14	11·55	9·41	3 00 2·74	12·40	19 69	1212
2·21	2·50 2·68	8·00 6·65	3·47	1·00 1·98	12·10	10·12	2·00 1·95	11·40	19 74	1213
Traces	.....	11·00 6·70	4·85	1·00 3·70	15·25	11·55	2·00 2·18	9·45	16 77	1214
.....	.....	.....	9·80	9·71	18·00 19·51	9·80	.....	0·02	17 42	1215

14—5½

TABLE I.—Statement of the Results of Examining 102 Standard

Number of Sample.	Name of Manufacturer.	By whom sent.	From what Material Produced.	Name or Brand of Fertilizer.
1216	The Leeds Phosphate Works, Hunslet, Leeds, England.	Manufacturers.....	.....	'Basic Slag'— Guaranteed..... Found.....
1217	The Thomas Phosphate Company.	Wm. Gray, Ottawa.	.....	'Thomas' Phosphate Powder'— Guaranteed..... Found.....
1218	W. Harris & Co., Toronto.	Manufacturers.....	.....	'Bone Meal'— Guaranteed..... Found.....
1219	" " ..	" " ..	Blood, flesh & bone.	'Brand H'— Guaranteed..... Found.....
1220	Thos. Reid, St. John N.B.	" " ..	.....	'Superphosphate'— Guaranteed..... Found.....
1221	Wm. Faint, Peterboro'.	" " ..	.....	'Bone Meal'— Guaranteed..... Found.....
1222	The Nova Scotia Fertilizer Co., Halifax N.S.	" " ..	} Tankage, char, { potash & kainite. { } Tankage, nitrate { of soda, char, { muriate of pot- { ash and kainite. {	'Ceres Superphosphate'— Guaranteed..... Found.....
1223	" " ..	" " ..		'Apple Tree Phosphate'— Guaranteed..... Found.....
1224	" " ..	" " ..		'Strawberry Phosphate'— Guaranteed..... Found.....
1225	" " ..	" " ..		'Potato Phosphate'— Guaranteed..... Found.....
1226	" " ..	" " ..	.....	'Ground Bone'— Guaranteed..... Found.....
1227	Victoria Chemical Co., Limited, Victoria, C.B.	" " ..	.....	'"A" Kainite'— Guaranteed..... Found.....
1228	" " ..	" " ..	.....	'"B" Muriate of Potash'— Guaranteed..... Found.....
1229	" " ..	" " ..	.....	'"C" Sulphate of Potash'— Guaranteed..... Found.....
1230	" " ..	" " ..	.....	'"D" Superphosphate'— Guaranteed..... Found.....
1231	" " ..	" " ..	.....	'"E" Nitrate of Soda'— Guaranteed..... Found.....
1232	" " ..	" " ..	.....	'"F" Mixed Fertilizer'— Guaranteed..... Found.....
1233	Russia Cement Co., Gloucester, Mass.	S. C. Shaffner, Clementsport, N.S.	.....	'Essex Complete Manure, for corn-grain and grass'— Guaranteed..... Found.....

SESSIONAL PAPER No. 14

Samples of Commercial Fertilizers, registered for 1901—Continued.

RESULTS OF ANALYSIS.										Number of Sample.
Nitrogen.		Phosphoric Acid.					Potash.	Mois- ture.	Relative Value per Ton of 2,000 lbs.	
Total including that of Nitric Acid or Ammonia, if present.	Total Calculated as Ammonia.	Soluble in Water.	Citric Soluble.	In- soluble.	Total.	Total Avail- able.				
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.				
.....	.....	.....	14.40	6.15	20.00 20.55	14.40	.....	.....	20 14	1216
.....	.....	.....	14.49	3.10	18.00 17.59	14.49	.....	.....	18 11	1217
4.54	5.51	.....	11.34	6.96	18.30	11.34	.....	1.80	30 33	1218
7.56	9.18	.....	7.50	2.80	10.30	7.50	.....	8.45	27 23	1219
4.83	5.86	1.80	4.50	3.60	9.90	6.30	1.87	15.60	21 74	1220
3.84	4.65	.....	13.94	6.76	20.70	13.94	.....	4.85	31 31	1221
1.97	2.00 2.40	2.69	4.98	6.08	13.75	7.67	2.14 4.56	6.16	20 05	1122
2.81	3.25 3.42	2.24	3.83	5.25	11.32	6.07	6.53 9.07	12.36	24 77	1223
2.46	2.02 2.99	2.37	2.42	5.57	10.36	4.79	6.50 10.62	5.92	24 22	1224
2.65	3.71 3.21	2.69	4.02	6.53	13.24	6.71	4.70 5.29	6.26	24 13	1225
2.94	3.57	.....	17.14	8.13	25.27	17.14	.....	8.60	34 04	1226
.....	.....	.....	.....	.....	.....	.....	12.00 11.49	.....	12 60 11 86	1227
.....	.....	.....	.....	.....	.....	.....	50.00 50.59	2.85	52 50 53 12	1228
.....	.....	.....	.....	.....	.....	.....	50.00 49.13	1.90	52 50 51 59	1229
.....	.....	16.00 15.70	0.92	0.68	17.30	16.62	0.66	13.50	21 22	1230
16.00 15.48	19.00 18.77	.....	.....	.....	.....	.....	.....	0.55	41 60 40 25	1231
2.00 2.33	2.70	4.16	0.96	0.64	5.00 5.76	5.12	3.50 3.55	8.63	15 56	1232
3.70 3.75	4.50 4.56	3.00 3.33	4.00 5.62	2.50 1.60	9.50 10.55	8.95	9.50 9.12	8.92	27 61 29 24	1233

1-2 EDWARD VII., A. 1902

TABLE I.—Statement of the Results of Examining 102 Standard

Numéro de l'échantillon.	Name of Manufacturer.	By whom sent	From what materials produced.	Name or Brand of Fertilizer.
1234	Russia Cement Co., Gloucester, Mass.	S. C. Shaffner, Clementsport, N.S.		'Market Garden and Potato Manure'— Guaranteed..... Found.....
1235	" " "	" "		'Essex XXX Fish and Potash'— Guaranteed..... Found.....
1236	H. B. Marcille, Thorold, Ont.	Manufacturers	Blood, meat and bone, with clay loam as a drier.	'Fertilizer'— Guaranteed..... Found.....
1237	New England Fertilizer Co., 43 North Market st., Boston Mass.	"	Nitrogen derived from organic matter. Phosphoric acid derived from high grade phosphates, and potash from high grade muriate and sulphate of potash.	'New England Potato Fertilizer'— Guaranteed..... Found.....
1238	" " "	"		'New England Corn Phosphate'— Guaranteed..... Found.....
1239	F. D. Burris, Truro N.S.	"		'General Phosphate'— Guaranteed..... Found.....
1240	" " "	"		'Bone Meal'— Guaranteed..... Found.....
1241	" " "	"		'Potato Phosphate'— Guaranteed..... Found.....
1242	Lowell Fertilizer Co., 44 North Market st., Boston, Mass.	"	Animal matter, high grade superphosphate, muriate of potash, and high grade sulphate of potash.	'Swift's Lowell Bone Fertilizer'— Guaranteed..... Found.....
1243	" " "	"		'Swift's Lowell Animal Fertilizer'— Guaranteed..... Found.....
1244	" " "	"		'Swift's Lowell Potato Phosphate'— Guaranteed..... Found.....
1245	" " "	"		'Swift's Lowell Potato Manure'— Guaranteed..... Found.....
1246	" " "	"		'Swift's Lowell Ground Bone'— Guaranteed..... Found.....
1247	B. and M. Rattenbury, Charlotte-town, P.E.I.	"		'Tankage, Blood, Potash and Nitrate of Soda Fertilizer'— Guaranteed..... Found.....
1248	" " "	"		'Dried Blood Fertilizer'— Guaranteed..... Found.....
1249	.....	Messrs. Wallace & Fraser, St. John N.B.		'Albert's Thomas' Phosphate Powder Basic Slag'— Guaranteed..... Found.....

SESSIONAL PAPER No. 14

Samples of Commercial Fertilizers, Registered for 1901.—*Concluded.*

RESULTS OF ANALYSIS.										Number of Sample.
Nitrogen.		Phosphoric Acid.					Potash.	Moist. ure.	Relative Value per ton of 2,000 lbs.	
Total, including that of Nitric Acid or Ammonia, if present	Total calculated as Ammonia.	Soluble in Water.	Citric Soluble.	In- soluble.	Total.	Total Avail- able.				
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	\$ cts.	
2·00	2·40	4·50	4·50	2·00	11·00	.....	5·00	.....	21 00	1234
2·51	3·04	5·44	3·97	2·24	11·65	9·41	4·79	11·62	22 62	
2·10	2·50	4·50	4·50	3·00	12·00	.....	2·25	.....	19 66	1235
2·42	2·84	6·72	3·51	2·56	12·79	10·23	2·74	7·17	21 38	
.....	5·78	.....	3·20	5·11	8·31	.....	3·95	3·65	.....	1236
3·30	4·01	0·60	3·43	4·16	8·19	4·03	3·76	5·02	20 52	
1·64	2·00	.....	.....	.....	.....	7·00	4·00	.....	.....	1237
2·39	2·90	3·20	3·64	1·92	8·76	6·84	4·65	4·30	19 14	
1·64	2·00	.....	.....	.....	.....	8·00	3·00	.....	.....	1238
2·08	2·53	3·84	4·92	1·92	10·68	8·76	3·38	7·35	19 14	
1·68	2·04	.....	3·20	0·64	3·84	3·20	3·20	17·17	11 14	1239
2·74	3·33	.....	5·11	11·52	16·63	5·11	0·02	0·32	23 74	1240
1·57	1·90	0·64	3·81	0·67	5·12	4·45	6·08	18·15	15 31	1241
1·66	2·00	.....	.....	.....	.....	8·00	3·00	.....	.....	1242
.....	2·02	4·48	4·49	0·63	9·60	8·97	3·29	7·44	17 51	
2·35	3·00	.....	.....	.....	.....	9 00	4·00	.....	.....	1243
.....	2·86	5·43	3·85	2·07	11·35	9·28	4·90	8·84	20 70	
2·35	3·00	.....	.....	.....	.....	8·00	6·00	.....	.....	1244
.....	2·86	2·56	5·59	1·12	9·27	8·15	8·00	4·96	22 82	
1·57	2·00	.....	.....	.....	.....	7·00	4·00	.....	.....	1245
.....	1·90	3·84	3·20	1·11	8·15	7 04	4·34	4·52	16 01	
2·46	3·00	.....	.....	.....	25·00	.....	.....	.....	.....	1246
.....	2·99	0·47	12·48	14·55	27·50	12·95	.....	3·60	34 74	
6·60	8·02	0·40	6·75	3·60	10·75	7·15	4·38	7·80	29 42	1247
9·47	10·90	.....	5·61	1·04	6·65	5·61	.....	17·25	29 94	1248
.....	.....	.....	11·83	3·20	15·00	.....	.....	.....	.....	1249
.....	.....	.....	.....	.....	15·03	11·83	.....	.....	15 25	

TABLE II.—Results of the Examination of 65

Date of Collection.	Number of Sample.	NAME AND ADDRESS OF		Name or Brand of Fertilizer.	Nitrogen.	
		Vendor.	Manufacturer or Furnisher as given by Vendor.		Total including that of Nitric Acid or Ammonia if present.	Total calculated as Ammonia.
1901.		<i>Charlottetown P.E.I.</i>	<i>Analyst, M. Bowman, Halifax, N.S.</i>		p. c.	p. c.
April 18	20039	B. & M. Rattenbury.	Vendor	'Dried Blood'— Guaranteed Standard sample..... Sample as sold.....	9·47 9·74	10·90 11·83
" 18	20040	A. Horn & Co	Swift's Lowell Fertilizer Co., Boston.	'Animal Brand'— Guaranteed Standard sample..... Sample sold.....	1·66 2·63	2·00 2·02 3·20
" 18	20041	" <i>Pictou N.S.</i>	" "	'Potato Manure'— Guaranteed Standard sample. Sample as sold.....	1·57 0·92	2·00 1·90 1·12
" 19	20042	J. W. D. Fraser... <i>Truro N.S.</i>	Bradley Fertilizer Co., Boston.	'Bradley's XL. Superphosphate'— Guaranteed..... Standard sample..... Sample as sold.....	2·06 2·67 2·24	2·50 3·25 2·72
" 19	20043	J. H. Kent..... <i>Kentville N.S.</i>	Bowker Fertilizer Co., Boston, Mass.	'Farm and Garden Fertilizer'— Guaranteed Standard sample... .. Sample as sold.. . . .	2·21 1·68	2·00 2·68 2·04
" 22	20044	DeWolf & Lamont <i>Windsor N.S.</i>	The Nova Scotia Fertilizer Co., Halifax	'Cere's Superphosphate'— Guaranteed Standard sample Sample as sold.	1·97 2·46	2·00 2·40 2·99
" 23	20045	E. C. Shand..... <i>Dartmouth N.S.</i>	Provincial Chemical Fertilizer Co., St. John, N.B.	'Imperial Superphosphate'— Guaranteed Standard sample..... Sample as sold.....	2·29 2·52 1·48	2·79 3·06 1·80
" 25	20046	E. M. Walker	The American Agricultural Chemical Co., Boston, Mass.	'Soluble Pacific Guano'— Guaranteed Standard sample..... Sample as sold.....	2·06 2·38 2·35	2·50 2·89 2·86
" 25	20047	Colin McNab.....	.....	'Thomas' Phosphate Powder'— Guaranteed..... Standard sample..... Sample as sold.....		
" 25	20048	W. McV. Smith.. <i>St. John N.B.</i>	Provincial Chemical Fertilizer Co., St. John, N.B. <i>Analyst, F. T. Harrison, London, Ont.</i>	'Potato Phosphate'— Guaranteed Standard sample..... Sample as sold.. . . .	2·63 3·30 1·32	3·19 4·01 1·60
" 16	17776	D. J. Seely & Son.	Bowker Fertilizer Co., Boston.	'Square Brand'— Guaranteed Standard sample..... Sample as sold.....	2·13 1·62	2·00 2·52 1·96

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Sample of Fertilizers as sold in 1901.

RESULTS OF ANALYSIS.							Relative value per ton of 2,000 lbs	Number of Sample.	Official Analyst's Remarks.
Phosphoric Acid.					Potash.	Moist- ure.			
Soluble in Water.	Citric soluble.	In- soluble.	Total.	Total Avail- able.					
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	\$ cts.		
.....	5.61	1.04	6.65	5.61	.....	17.25	29 94	20039	
0.74	4.07	1.59	6.40	4.81	.....	17.19	30 34	.....
.....	.....	.....	.....	8.00	3.00	.....	.....	20040	
4.48	4.49	0.63	9.60	8.97	3.29	7.44	17 51	.....
3.17	4.82	3.07	11.06	7.99	3.97	8.94	20 50	.....
.....	.....	.....	.....	7.00	4.00	.....	.....	20041	
3.84	3.20	1.11	8.15	7.04	4.34	4.52	16 01	.....	Below guarantee in am- monia and potash.
8.00	1.21	5.69	14.90	9.21	1.76	18.30	16 70	.....
.....	
5.00	3.00	2.00	10.00	8.00	1.50	.....	16 41	20042	
6.40	4.09	1.60	12.09	10.49	3.52	12.08	22 77	.....
6.41	2.43	2.83	11.67	8.84	.....	12.51	16 58	.....
.....	.....	.....	10.00	8.00	2.00	.....	19 62	20043	Genuine.
4.28	4.84	2.58	11.70	9.12	2.95	5.50	21 43	.....
5.89	3.44	2.82	11.15	9.33	2.25	19.30	18 09	.....
.....	.....	.....	.....	.....	2.14	.....	.....	20044	
2.69	4.98	6.08	13.75	7.67	4.56	6.16	20 05	.....
3.81	1.70	3.07	8.58	5.51	2.49	19.11	15 88	.....
.....	
6.43	1.56	8.28	16.27	7.99	2.27	.....	19 80	20045	Below guarantee in am- monia.
7.50	3.26	6.64	17.40	10.76	2.35	9.10	23 10	.....
4.83	2.81	7.40	15.04	7.64	1.84	12.76	16 39	.....
.....	
5.00	3.00	2.00	10.00	8.00	1.50	.....	16 41	20046	
6.80	3.19	1.86	11.85	9.99	2.20	13.55	20 25	.....
5.69	2.05	2.53	10.27	7.74	1.64	18.94	17 21	.....
.....	.....	.....	18.00	.....	.....	.....	.....	20047	
.....	9.80	9.71	19.51	9.80	.....	0.02	17 58	.....
Trace.	11.05	6.33	17.28	11.05	.....	0.46	16 59	.....
.....	
6.38	1.63	6.64	14.65	8.01	5.29	.....	23 30	20048	Below guarantee in am- monia and potash.
6.97	2.57	5.86	15.40	9.54	6.49	8.25	27 68	.....
6.04	2.68	5.34	14.06	8.72	3.67	12.50	18 82	.....
.....	
.....	.....	.....	12.00	6.00	2.00	.....	.....	17776	
2.05	6.97	3.38	12.40	9.02	2.66	3.45	18 52	.....	Unadulterated
1.53	4.90	5.05	11.48	6.43	2.82	7.75	15 59	.....

TABLE II.—Results of the Examination of 65

Date of Collection.	Number of Sample.	NAME AND ADDRESS OF		Name or Brand of Fertilizer.	Nitrogen.		
		Vendor.	Manufacturer or Furnisher as given by Vendor.		Total, including that of Nitric Acid or Ammonia if present.	Total, calculated as Ammonia.	
					p. c.	p. c.	
1901.		St. John N.B.	Analyst, F. T. Harrison—Con.				
April 17	17777	Thomas Reid.....	Vendor	'Superphosphate of Lime'— Guaranteed .. Standard sample..... Sample as sold.....	4·83 4·26	5·86 5·17	
" 17	17778	Provincial Chemical Fertilizer Co. Sussex N.B.	Vendors.. ..	'Potato Phosphate'— Guaranteed .. Standard sample..... Sample as sold.....	2·63 3·30 3·16	3·19 4·01 3·84	
" 19	17779	J. A. McArthur ..	Swift's Lowell Fertilizer Co., Boston.	'Potato Phosphate'— Guaranteed .. Standard sample..... Sample as sold.....	2·35 2·76	3·00 2·86 3·36	
" 19	17780	J. A. Humphreys. St. Andrews, N.B.	The Nova Scotia Fertilizer Co., Halifax	'Cere's Superphosphate'— Guaranteed .. Standard sample..... Sample as sold.....	1·97 2·99	2·40 3·64	
" 23	17781	G. D. Grimmer, Water St.	E. Frank Coe, Front St., New York.	'Grass and Grain'— Guaranteed .. Sample as sold.....	1·10	1·25	
" ..	17782	H. O'Neill, Water St. St. Stephen, N.B.	Provincial Chemical Fertilizer Co., Ltd., St. John, N.B.	'Imperial Superphosphate'— Guaranteed..... Standard sample .. Sample as sold.....	2·29 2·52 2·09	2·79 3·06 2·54	
" 24	17783	Henry E. Hill, King St.	American Agricultural Co, New York.	'XL Superphosphate'— Guaranteed .. Standard sample..... Sample as sold.....	2·06 2·67 2·73	2·50 3·25 3·31	
" 24	17784	Hugh McKenna, King St.	Parmenter & Polsey Fertr. Co., Peabody, Mass.	'Plymouth Rock'— Guaranteed .. Sample as sold	3·33	4·04	
" 6	19803	R. J. Latimer, rue McGill.	Nichols Cheml. Co., Capelton, Qué.	'Royal Canadian'— Guaranteed ... Standard sample..... Sample as sold.....	4·06 4·57	4·00 4·94 5·55	
" 6	19804	" ..	" ..	'Victor'— Guaranteed .. Standard sample..... Sample as sold.....	2·36 1·86	2·00 2·87 2·26	
" 6	19805	Brodie & Harris, rue Bleury.	Standard Chemical Fertr. Co., Smith's Falls, Ont.	'Standard'— Guaranteed Standard sample..... Sample as sold.....	2·44 2·31	2·50 2·95 2·81	
" 6	19806	" ..	" ..	'Special'— Guaranteed .. Standard sample..... Sample as sold	3·15 2·93	3·50 3·82 3·55	

SESSIONAL PAPER No. 14

Samples of Fertilizers as sold in 1901.—Continued.

RESULTS OF ANALYSIS.							Relative Value per ton of 2,000lbs.	Number of Sample.	Official Analyst's Remarks.
Phosphoric Acid.					Potash.	Moist-ure.			
Soluble in Water.	Citric Soluble.	In-soluble.	Total.	Total Avail-able.					
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	\$ cts.		
								17777	Unadulterated.
1·80	4·50	3·60	9·90	6·30	1·87	15·60	21 74	.....
1·72	3·79	5·24	10·75	5·51	.....	21·30	17 30	.....
6·38	1·63	6·64	14·65	8·01	5·29	.....	23 30	17778	
6·97	2·57	5·86	15·40	9·54	6·49	8·25	27 68	.....
6·84	2·24	5·05	14·13	9·08	4·01	8·00	23 97	.....	"
				8·00	6·00	.....	.....	17779	
2·56	5·59	1·12	9·27	8·15	8·00	4·96	22 82	.....
6·20	1·48	1·53	9·21	7·68	6·45	7·47	22 92	.....	"
					2·14	.....	.....	17780	
2·69	4·98	6·08	13·75	7·67	4·56	6·16	20 05	.....
3·96	2·50	2·49	8·95	6·46	2·56	14·95	18 12	.....	"
Not registered for 1901, therefore sold illegally.....							.....	17781	
6·78	2·24	2·36	11·38	9·02	2·01	15·02	16 06	...	"
6·43	1·56	8·28	16·27	7·99	2·27	.....	19 80	17782	
7·50	3·26	6·64	17·40	10·76	2·35	9·10	23 10	.....
6·70	2·13	3·51	12·34	8·83	1·23	14·50	17 74	.....	"
5·00	3·00	2·00	10·00	8·00	1·50	.....	16 41	17783	
6·40	4·09	1·60	12·09	10·49	3·52	12·08	22 77	.....
8·00	2·43	1·02	11·45	10·43	2·29	15·07	21 53	.....	"
.....	Not registered for 1901, and therefore sold illegally.....							17784	
3·45	5·89	1·15	10·49	9·34	4·40	8·12	23 57	.....	"
				9·00	5·00	.....	.....	19803	Genuine and up to guar- antee.
9·30	0·62	3·08	13·00	9·92	5·23	4·90	27 99	.....
6·88	1·79	2·30	10·97	8·67	6·52	10·45	28 74	.....
				7·00	3·00	.....	.....	19804	
6·30	1·25	4·55	12·10	7·55	3·92	9·40	20 08	.....
6·07	3·00	3·99	13·06	9·07	3·50	12·62	18 92	.....	"
			11·00	9·00	2·00	.....	.....	19805	
6·07	3·48	2·55	12·10	9·55	2·42	7·05	20 83	.....
7·67	1·93	2·71	12·31	9·60	2·90	12·05	20 72	....	"
			10·00	8·00	6·00	.....	.....	19806	
6·22	3·06	1·50	10·87	9·28	7·48	7·20	26 69	.....
8·36	1·34	2·77	12·47	9·70	6·65	11·05	26 34	.....	"

TABLE II.—Results of the Examination of 65

Date of Collection.	Number of Sample.	NAME AND ADDRESS OF		Name or Brand of Fertilizer.	Nitrogen.	
		Vendor.	Manufacturer or Furnisher as given by Vendor.		Total, including that of Nitric Acid or Ammonia if present.	Total, calculated as Ammonia.
1901		Quebec.	Analyst, Dr. M. Fiset.—Con.		p. c.	p. c.
April 11	19807	P.-T. Legaré, St. Paul St.	Nichols Cheml. Co., Capelton, Que.	'Reliance'— Guaranteed Standard sample..... Sample as sold.. ..	..... 2·35 2·08	2·00 2·85 2·53
" 11	19808	"	"	'Capelton Superphosphate'— Guaranteed Standard sample..... Sample as sold.. ..	..... ..... .....	..... ..... .....
" 11	19809	"	"	'No. 1 Superphosphate'— Guaranteed Standard sample..... Sample as sold.....	..... ..... Trace.	..... ..... Trace.
		Coaticook Que.				
" 12	19810	H. E. Baldwin, farmer.	American Agricultural Chemical Co., New York.	'Eclipse Phosphate'— Guaranteed Standard sample..... Sample as sold.....	1·03 1·41 1·22	1·25 1·72 1·48
" 12	19811	"	"	'Standard'— Guaranteed Standard sample Sample as sold.....	0·82 1·43 1·05	1·00 1·73 1·28
" 12	19812	"	"	'Potato Special'— Guaranteed Standard sample..... Sample as sold.....	2·06 2·17 2·27	2·50 2·63 2·75
		East Stanbridge, Q.	Analyst, E. B. Kenrick, Winnipeg.			
" 16	19813	D. Phelps, farmer.	Bowker Fertr. Co...	'Potato & Vegetable Fertilizer'— Guaranteed Standard sample..... Sample as sold... ..	..... 2·00 1·85	2·00 2·43 2·25
" 16	19814	"	"	'Square Brand'— Guaranteed Standard sample..... Sample as sold.....	..... 2·13 1·85	2·00 2·52 2·25
" 16	19815	"	"	'Vermont Fertilizer'— Guaranteed Standard sample..... Sample as sold.....	..... 2·64 2·49	3·00 3·21 3·02
		Waterloo P. Q.				
" 17	19816	Allen Taylor & Co.	Pacific Guano Co....	'Potato Special'— Guaranteed Standard sample..... Sample as sold.....	2·06 2·17 2·46	2·50 2·63 2·99
" 17	19817	W. L. Whytcomb.	Read Fertilizer Co., New York.	'Samson'— Guaranteed Standard sample..... Sample as sold.....	..... ..... 2·10	..... ..... 2·55

SESSIONAL PAPER No. 14

Samples of Fertilizers, as sold in 1901.—Continued.

RESULTS OF ANALYSIS.							Relative value per ton of 2,000 lbs	Number of Sample.	Official Analyst's Remarks.
Phosphoric Acid.					Potash.	Moist- ure.			
Soluble in Water.	Citric soluble.‡	In- soluble.	Total.	Total Avail- able.					
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	\$ cts.		
				6.00	2.00			19807	Genuine and up to guar- antee.
5.58	1.55	4.82	11.95	7.13	2.72	5.05	18 35		
6.55	1.45	4.31	12.31	8.00	5.00	14.40	20 99		
				8.00				19808	" "
8.20	0.90	5.10	14.20	9.10		9.95	13 36		
8.00	0.96	6.23	15.19	8.96	0.50	12.78	13 05		
				11.50				19809	" "
10.48		4.70	15.18	10.48		11.50	13 91		
7.83	2.72	5.27	15.82	10.55	0.49	13.62	14 14		
6.00	2.00	2.00	10.00	8.00	2.00		14 57	19810	" "
6.21	3.26	2.05	11.52	9.47	2.47	15.32	17 62		
7.19	2.73	1.75	11.67	9.92	2.30	15.85	17 57		
5.00	3.00	2.00	10.00	8.00	4.00		13 97	19811	" "
6.60	2.85	1.90	11.35	9.45	4.88	23.84	20 17		
4.32	4.33	2.56	11.20	8.65	4.25	17.30	17 69		
5.00	3.00	2.00	10.00	8.00	3.00		17 99	19812	" "
6.50	3.12	1.88	11.50	9.62	3.46	13.00	20 63		
5.12	3.84	1.75	10.71	8.96	3.68	15.35	20 19		
			11.00	9.00	2.00			19813	Genuine.
4.40	5.00	2.30	11.70	9.40	2.14	6.15	19 04		
5.32	2.93	2.78	11.03	8.25	2.32	15.93	17 31		
			12.00	6.00	2.00			19814	"
2.05	6.97	3.38	12.40	9.02	2.66	3.45	18 52		
5.08	3.28	4.84	13.20	8.36	2.58	10.90	18 31		
			10.00	8.00	4.00			19815	"
8.00	1.53	0.92	10.45	9.53	4.26	7.00	22 73		
4.74	3.05	4.01	11.80	7.79	4.25	14.44	20 69		
5.00	3.00	2.00	10.00	8.00	3.00		17 99	19816	"
6.50	3.12	1.88	11.50	9.62	3.46	13.00	20 63		
4.35	2.27	4.15	10.77	6.62	3.72	11.81	18 77		
Not registered for 1901, and therefore sold illegally								19817	"
4.54	1.84	1.71	8.09	6.38	3.89	21.02	17 10		

TABLE II.—Results of the Examination of 65

Date of Collection.	Number of Sample.	NAME AND ADDRESS OF		Name or Brand of Fertilizer.	Nitrogen.	
		Vendor.	Manufacturer or Furnisher as given by Vendor.		Total including that of Nitric Acid or Ammonia if present.	Total calculated as Ammonia.
1901.		Waterloo, Que.	Analyste, Dr. M. Fiset—Con.		p. c.	p. c.
April 17	19818	W. L. Whytcomb.	Read Fertilizer Co., New York.	'Read's Leader'— Guaranteed Standard sample Sample as sold.....	0·82 1·22 1·14	1·00 1·48 1·38
" 17	19819	" ..	" ..	'Farmers' Friend'— Guaranteed Standard sample..... Sample as sold.. ..	 2·05	 2·49
" 16	19820	G. Truax	Bradley Fertilizer Co Analyste, Dr. F. X. Valade.	'Eclipse Phosphate'— Guaranteed Standard sample..... Sample as sold.....	1·03 1·41 1·00	1·25 1·72 1·21
" 1	20829	Graham Bros., flor- ists.	The W. A. Freeman Co., Hamilton, Ont.	'Tankage'— Guaranteed Standard sample..... Sample as sold.....	 7·36 4·34	5·00 8·94 5·27
" 1	20830	" ..	" ..	'Dominion Flower Fertilizer'— Guaranteed Standard sample..... Sample as sold.....	 5·32	 6·46
" 2	20831	The Standard Fer- tilizer and Chem- ical Co., Ltd.	Vendors	'No. 1 Fertilizer'— Guaranteed Standard sample..... Sample as sold.. ..	 2·41 2·95	2·00 2·92 3·67
" 2	20832	" ..	" ..	'Standard Fertilizer'— Guaranteed Standard sample..... Sample as sold.....	 2·44 2·24	2·50 2·95 2·72
" 2	20833	" ..	" ..	'Special Fertilizer'— Guaranteed Standard sample..... Sample as sold.....	 3·15 2·95	3·50 3·82 3·67
" 3	20834	Brown & Co. . . .	Bradley Fertilizer Co	'Bone with Potash'— Guaranteed Standard sample..... Sample as sold.....	 1·54	Taken from 1·87
" 3	20835	" ..	" ..	'Potato Fertilizer'— Guaranteed Standard sample..... Sample as sold.....	2·06 2·23 2·10	2·50 2·70 2·55
" 3	20836	The Belleville Can- ning Co.	" ..	'Guano'— Guaranteed Standard sample..... Sample as sold.. ..	 1·96	Taken from 2·38

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Samples of Fertilizers as sold in 1901.—Continued.

RESULTS OF ANALYSIS.							Relative value per ton of 2,000 lbs	Number of Sample.	Official Analyst's Remarks.
Phosphoric Acid.					Potash.	Moist- ure.			
Soluble in Water.	Citric soluble.	In- soluble.	Total.	Total Avail- able.					
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	\$ cts.		
5.00	2.00	1.00	8.00	7.00	1.00	.....	11 52	19818	Genuine.
3.10	5.25	2.95	11.30	8.35	3.07	11.02	15 53		
5.03	2.49	2.84	10.36	7.52	2.18	20.25	14 66	.....
.....	Not registered for 1901, and therefore sold illegally.							19819	
7.13	1.49	2.44	11.06	8.62	2.00	16.58	17 96	.....	"
6.00	2.00	2.00	10.00	8.00	2.00	.....	14 57	19820	
6.21	3.26	2.05	11.52	9.47	2.47	15.32	17 62		
6.35	2.54	3.27	12.16	8.89	2.23	16.77	16 75	.....	"
.....	.....	.....	12.00	.....	.....	.....		20829	
.....	10.96	3.04	14.00	10.96	.....	4.70	32 76		
0.92	8.70	2.40	12.02	9.62	0.70	5.90	24 23	....	"
.....	.....Not registered for 1901.....							20830	
6.10	2.74	2.25	11.09	8.84	5.24	5.04	29 27	....	"
.....	.....	.....	11.00	9.00	1.00	.....		20831	
6.51	3.27	2.30	12.10	9.78	1.21	5.70	19 23		
7.10	1.88	2.13	11.11	8.98	1.35	13.10	19 73	.....	"
.....	.....	.....	11.00	9.00	2.00	.....		20832	
6.07	3.48	2.55	12.10	9.55	2.42	7.05	20 83		
7.86	1.28	1.57	10.71	9.14	2.33	15.03	19 14	...	"
.....	.....	.....	10.00	8.00	6.00	.....		20833	
6.22	3.06	1.50	10.87	9.28	7.48	7.20	26 69		
6.84	1.12	1.73	9.69	7.96	6.76	12.35	24 13	.....	"
last year's stock, not registered for 1901, and therefore sold illegally.								20834	
5.63	3.42	2.25	11.30	9.05	2.55	13.06	17 57	...	"
5.00	3.00	2.00	10.00	8.00	3.00	.....	17 99	20835	
6.72	2.87	2.05	11.64	9.59	3.96	12.76	21 34		
4.48	4.50	0.92	9.90	8.98	2.94	14.38	18 73	.....	"
last year's stock, not registered for 1901, and therefore sold illegally.								20836	
6.65	1.96	1.70	10.31	8.61	1.45	16.67	16 87	.....	"

TABLE II.—Results of the Examination of 65

Date of Collection.	Number of Sample.	NAME AND ADDRESS OF		Name or Brand of Fertilizer.	Nitrogen.	
		Vendor.	Manufacturer or Furnisher as given by Vendor.		Total including that of Nitric Acid or Ammonia if present.	Total calculated as Ammonia.
1901.		Belleville—Con.			p. c.	p. c.
April 4	20837	C. E. Bishop.. ..	Analyst, Dr. W. H. Ellis, Toronto.	'Thomas' Phosphate Powder'— Guaranteed Standard sample..... Sample as sold.....		
" 2	20838	The Standard Chemical & Fertilizer Works.	Vendor....	'The Royal'— Guaranteed Standard sample..... Sample as sold.....	2·83 1·82	2·00 3·43 2·21
" 2	20839	" ..	" ..	'Corn & Grass'— Guaranteed Standard sample..... Sample as sold..	2·77 2·30	2·00 3·37 2·78
" 2	20840	" ..	" ..	'Superphosphate of Lime'— Guaranteed Standard sample..... Sample as sold.....		
" 4	20841	The Belleville Can-ning Co.	Bradley Co. Fertilizer	'Potato Fertilizer'— Guaranteed Standard sample..... Sample as sold.....	2·06 2·23 2·31	2·50 2·70 2·89
" 4	20842	" ..	" ..	'Complete Manure for Potatoes' Guaranteed Standard sample..... Sample as sold.....	4·94	6·00
" 4	20843	Geo. Thompson...		'Thomas' Phosphate'— Guaranteed Standard sample..... Sample as sold.....		
" 4	20844	"	Bradley Co. Fertilizer	'Guano'— Guaranteed Standard sample..... Sample as sold.....	2 32	2·82
" 6	20845	J. A. Simmers, 147 rue King.	W. A. Freeman Co., Hamilton.	'Sure Growth'— Guaranteed Standard sample..... Sample as sold..	3·44 5·14	3·50 4·18 6·24
" 6	20846	"	"	'Bone Meal'— Guaranteed Standard sample..... Sample as sold.....	3·67 3·96	3·00 4·45 4 81
" 6	20847	"	W. Harris & Co., Toronto.	Brand 'H'— Guaranteed Standard sample..... Sample as sold.....	7·56 8·59	9·18 10·44

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Sample of Fertilizers as sold in 1901—Continued.

RESULTS OF ANALYSIS.							Relative value per ton of 2,000 lbs	Number of Sample.	Official Analyst's Remarks.
Phosphoric Acid-					Potash.	Mois- ture.			
Soluble in Water.	Citric soluble.	In- soluble.	Total.	Total Avail- able.					
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	\$ cts.		
			18.00					20837	
	9.80	9.71	19.51	9.80		0.02	17 58		
	10.10	7.25	17.35	10.10		0.27	16 19		Genuine.
			9.00	8.00	3.00			20838	
7.04	3.32	0.64	11.00	10.36	3.79	6.12	23 06		
7.06	2.75	2.97	12.78	9.81	2.93	12.94	21 91		
			9.00	7.00	4.00			20839	
6.85	2.88	1.15	10.88	9.73	5.74	5.02	24 41		
7.85	1.50	3.98	13.33	9.35	3.20	13.08	21 14		Up to standard and guar- antee in phosphoric acid and nitrogen. Below guarantee in potash.
			16.00	14.00				20840	
2.66	1.74	2.55	16.95	14.40		6.65	17 87		
6.32	9.35	4.04	19.71	15.67		11.88	19 07		Up to guarantee.
5.00	3.00	2.00	10.00	8.00	3.00		17 99	20841	
6.72	2.87	2.05	11.64	9.59	3.96	12.76	21 34		
5.23	7.48	4.72	17.43	12.71	3.46	5.98	25 10		Up to guarantee.
Not registered under this name..								20842	
5.47	3.49	2.34	11.30	8.96	6.76	10.75	30 06		
			18.00					20843	
	9.80	9.71	19.51	9.80		0.02	17 58		
	12.26	6.42	18.68	12.26		0.20	17 98		Up to guarantee.
Not registered for 1901, and therefore sold illegally.									
								20844	
5.06	3.29	5.40	13.75	8.35	1.83	11.71	18 80		
			8.00		3.00			20845	
6.08	2.62	1.00	9.70	8.70	5.44	2.49	24 45		
6.10	2.49	3.41	12.00		3.50	13.59	26 89		Up to guarantee.
			23.00					20846	
0.23	13.65	8.72	22.60	13.88		7.30	32 82		
Trace.	9.07	14.16	23.23	9.07	0.33	7.55	33 98		Up to guarantee.
								20847	
	7.50	2.80	10.30	7.50		8.45	27 23		
Trace.	3.31	2.60	5.91	3.31	0.30	14.56	25 35		

TABLE II.—Results of the Examination of 65

Date of Collection	Number of Sample.	NAME AND ADDRESS OF		Name or Brand of Fertilizer.	Nitrogen.	
		Vendor.	Manufacturer or Furnisher as given by Vendor.		Total, including that of Nitric Acid or Ammonia if present.	Total, calculated as Ammonia.
1901.		Stratford, Ont.	Analyst, F. T. Harrison, London, Ont.		p. c.	p. c.
Mar. 29	19483	W. R. Marshall & Co.	Bradley, Fertilizer Co.	Dissolved Bone— Guaranteed Standard sample..... Sample as sold.....	..... ..... 0·21	..... ..... 0·25
" 29	19484	Hodd & Cullen.... St. Thomas, Ont.	.....	'Thomas' Phosphate Powder'— Guaranteed Standard sample..... Sample as sold.....	..... ..... .....	..... ..... .....
" 30	19485	J. Marlatt.....	American Agricultural Chemical Co., Rochester, N.Y.	'New Method Fertilizer'— Guaranteed Standard sample..... Sample as sold.....	1·03 1·34 1·22	1·25 1·63 1·48
April 1	19486	Ingersoll Packing Co., Ont.	Vendors.....	'Ingersoll Fertilizer'— Guaranteed Standard sample..... Sample as sold.....	..... 7·97 7·63	9·00 9·67 9·28
" 2	19487	W. A. Freeman Co., Hamilton.	"	'Sure Growth'— Guaranteed Standard sample..... Sample as sold.....	..... 3·44 4·16	3·50 4·18 5·05
" 2	19488	"	"	'Bone and Potash'— Guaranteed Standard sample..... Sample as sold..	..... 2·33 3·60	2·00 2·46 4·37
		St. Catharines, Ont.				
" 3	19489	Titterington & Co.	Bradley, Fertilizer Co.	'B. D. Sea Fowl Guano'— Guaranteed Standard sample..... Sample as sold..	..... ..... 2·15	..... ..... 2·62
		Niagara Falls, Ont				
" 3	19490	L. H. Taylor.....	.....	'Thomas' Phosphate Powder'— Guaranteed .. Standard sample..... Sample as sold.....	..... ..... .....	..... ..... .....
		Woodstock, Ont.				
" 4	19491	Edwin Hersey....	W. Harris & Co., Toronto.	'Ground Bone'— Guaranteed Standard sample..... Sample as sold.. 4·54 4·45 5·51 5·40

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Samples of Fertilizers as sold in 1901—*Concluded.*

RESULTS OF ANALYSIS.							Relative value per ton of 2,000 lbs.	Number of Sample.	Official Analyst's Remarks.
Phosphoric Acid.					Potash.	Moist- ure.			
Soluble in Water.	Citric soluble.	In- soluble.	Total.	Total Avail- able.					
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	\$ cts.		
Not registered for 1901, under this name, and therefore sold illegally...								19483	Unadulterated.
6.27	4.80	2.94	14.01	11.07		7.87	16.24		
			18.00					19484	"
	9.80	9.71	19.51	9.80		0.02	17.58		
	12.73	2.43	15.16	12.73		0.40	15.70		
6.00	2.00	2.00	10.00	8.00	2.00		14.57	19485	"
5.89	4.02	1.73	11.64	9.91	3.03	15.14	18.41		
4.28	2.37	4.99	11.64	6.65	2.56	14.80	14.87		
	5.50	6.80				8.00		19486	"
	10.40	0.80	11.20	10.40	0.64	8.10	32.04		
0.45	8.50	3.20	12.15	8.95	0.31	7.00	31.72		
			8.00		3.00			19487	"
6.08	2.62	1.00	9.70	8.70	5.44	2.49	24.45		
4.22	3.20	3.77	11.19	7.42	2.71	12.65	22.54		
			9.00		6.00			19488	"
5.95	2.48	2.32	10.75	8.43	8.47	4.17	24.43		
3.58	2.69	3.26	9.53	6.27	9.50	12.10	26.88		
Not registered for 1901, under this name, and therefore sold illegally...								19489	"
4.35	3.58	3.26	11.19	7.93	1.10	15.07	16.48		
			18.00					19490	"
	9.80	9.71	19.51	9.80		0.02	17.58		
	12.47	3.96	16.37	12.47		0.25	16.84		
								19491	"
	11.34	6.96	18.30	11.34		1.80	30.33		
	14.76	5.24	20.00	14.76		4.22	32.16		

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LABORATORY OF THE INLAND REVENUE DEPARTMENT,

OTTAWA, December 31, 1900.

THOS. MACFARLANE, Esq., F.R.S.C., &c.,
Chief Analyst.

SIR,—In accordance with your request, I have made a study of certain modifications of official methods in the analysis of fertilizers proposed by you, having reference to the determination of phosphoric acid in its different combinations. I beg to submit herewith a synopsis of the result of my work.

CLASSIFICATION OF PHOS. ACID IN FERTILIZERS.

The phosphoric acid present in commercial fertilizers is valued differently according as it is (1) soluble in water; (2) insoluble in water, but soluble in neutral citrate of ammonia; (3) insoluble in either menstruum. These three classes are commonly spoken of as (1) *soluble phosphoric acid*, supposed to be that present in the free state, or combined with lime as monocalcium phosphate; (2) *reverted phosphoric acid*, supposed to be that present as the di-calcium phosphate; (3) *insoluble phosphoric acid*, or that present as tri-calcium phosphate. The soluble and reverted phosphoric acid together are usually styled *available phosphoric acid*.

OBJECT OF INVESTIGATION.

The object of the following work is to determine how the distribution of the total phosphoric acid present in a given fertilizer will be affected by using *one* and *two* per cent citric acid instead of neutral ammonium citrate; also, in the case of basic slags, what will be the effect of separating free lime by solution of chloride of ammonium, before applying citric acid, and finally the influence of different methods of applying the solvents.

PRECAUTION AS TO SAMPLING.

In order that the results may be interpreted with confidence, it is necessary to determine the magnitude of the variation introduced by sampling as this process is defined by the Association of Official Agricultural Chemists (Washington, 1898). These require that the prepared sample should pass through a sieve, having circular perforations of one millimetre diameter (one twenty-fifth of an inch). Such a degree of fineness is easily attainable, even with moist fertilizers, containing fibrous matter. It is, however, much too coarse to permit of exact duplicate portions of two grams being weighed out, and is, besides, very indefinite. For two portions (say 25 grams each) of a given sample may be so ground that while each fulfils the condition of passing entirely through a 1 mm sieve, 90 per cent of one portion shall pass through a 0.25 mm sieve, while not 10 per cent of the second portion does so. An important consequence of this coarse and irregular grinding is that it is impossible to weigh out successive portions of two grams such that exact duplicate estimations of phosphoric acid (or other constituent) are obtained on analysis.

SUGGESTION AS TO FINENESS.

It is much to be desired that samples should be ground to a fineness determined by the whole passing through a sieve of, say, 60 meshes per inch. This can only be done, in most cases, by artificially drying the sample before grinding, a condition which might affect the classification of the contained phosphoric acid. That the changes brought about by drying the sample are very slight, is evident from some results in soluble and reverted phosphoric given in the tables. (Ex. 7-27).

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The following samples were employed in this work :—

DESCRIPTION OF SAMPLES.

No. 1045—Bradley's XL Superphosphate—	
Contains—Total phosphoric acid ($P_2 O_5$)	13.32
“ nitrogen	2.29
“ potash ($K_2 O$)	2.9
“ moisture	8.40
No. 1074—Capelton Superphosphate—	
Contains—Total phosphoric acid ($P_2 O_5$)	15.02
“ moisture	8.85
No. 1114—Reid's Superphosphate—	
Contains—Total phosphoric acid ($P_2 O_5$)	15.19
“ nitrogen	3.71
“ potash ($K_2 O$)	1.69
“ moisture	26.46
This fertilizer was too wet to be satisfactorily sampled, and was dried, before grinding, so that the material prepared for analysis contained 17.15 per cent water.	
No. 1088—Superphosphate of Lime—	
Contains—Total phosphoric acid ($P_2 O_5$)	25.52
“ moisture	6.80
No. 1090—No. 1 Fertilizer, Standard Chemical Co.—	
Contains—Total phosphoric acid	22.52
“ nitrogen	1.41
“ potash ($K_2 O$)	1.68
“ moisture	8.50
No. 1057 } Thomas' Phosphate Powder—	
“ 1128 }	
Contain only traces of moisture.	

PREPARATION OF SAMPLES.

The portions taken for analysis were ground to the following degrees of fineness:—
No. 1045—All passed through a sieve of 40 meshes per inch, and over 50 per cent through a sieve of 60 meshes.
No. 1074—All passed through a 40 mesh sieve, and 80 per cent through a 60 mesh.
No. 1114—75 per cent passed through a 40 mesh sieve, and about 50 per cent through a 60 mesh. The coarser portion (about 25 per cent of the whole) consisted of scraps of skin, hairs and miscellaneous organic debris.
No. 1088 } —All passed through a 40 mesh sieve, and about 75 per cent through a
“ 1090 } 60 mesh.
“ 1057 } —All passed through a 40 mesh sieve, and more than 90 per cent through
“ 1128 } a 60 mesh.

ESTIMATION OF $P_2 O_5$.

All determinations of phosphoric acid were made by molybdate. Most of the work was done by titration of the yellow precipitate with standard potash and nitric acid, but many estimations were checked by the magnesia method.
I have found, by a long series of titrations of solutions containing known amounts of phosphoric acid, that the process, in my hands, involves a possible mean error of about 0.1 per cent $P_2 O_5$. Hence, the results in the following tables cannot be safely interpreted within narrower limits than this.

HOW STATED.

All the results tabulated are stated as percentage numbers calculated on the dry material.

THE ROTATOR.

The 'Rotator,' used in many of the experiments recorded, is a wheel of wood, 15 inches in diameter, to which 4 Erlenmeyer's of 300 cc. can be radially attached. The surface of the wheel is cut out in such a way that the Erlenmeyer is fitted into the depression, where it is held by rubber bands passing over small brass hooks screwed into the wheel. This wheel is driven by a small water motor at the rate of 30—40 revolutions per minute. Owing to fluctuations in our water pressure, it has occasionally happened that the rate has been reduced to 20 per minute, which may account for certain irregular results.

VARIATION DUE TO SAMPLING.

TABLE I.—Variations due to Imperfect Sampling.

Serial Number of Experiment.	Sample 1045.	Sample 1074.	Sample 1114.	Sample 1057.	Sample 1128.
1.....	13·25	15·09	15·48	17·91	17·40
2.....	13·43	14·75	15·10	17·70	17·56
3.....	13·50	15·22	15·06	.....	.....
4.....	13·11	.....	15·30	.....	.....
5.....	13·34	.....	15·00	.....	.....
Total mean P ₂ O ₅	13·32	15·02	15·19	17·80	17·48

Each estimation was made upon a separate solution of two grams in nitro-hydrochloric acid. In the basic slags a considerable excess of hydrochloric acid was used, and subsequently got rid of by evaporation. The maximum deviations from mean value are as follows:—

0·21 0·27 0·29 0·11 0·08

It has already been noticed that an error of about 0·1 may be due to the method of working. This leaves an additional error of somewhat larger amount to be accounted for by the sampling.

SOLUBLE P₂ O₅ BY OFFICIAL METHOD.

TABLE II.—Soluble phosphoric acid.

Experiment.	1045.	1074.	1114.	
7.....	5·83	6·65	2·25	} Made on anhydrous sample.
8.....	5·85	6·40	2·15	
9.....	5·73	6·55	2·22	
Mean.....	5·80	6·53	2·21	
10.....	5·75	7·36	1·30	} Made on normal sample.
11.....	5·70	7·00	1·16	
12.....	5·78	6·67	
13.....	6·86	
Mean.....	5·73	6·97	1·23	

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The estimations of soluble phosphoric acid recorded in Table II. were made by treating two grams of the sample on a 9 c m filter with water until the filtrate measured 250 cbc. The first three estimations in each sample were made upon the material dried at 100° C. It will be seen that in samples 1045 and 1114 a slightly higher percentage of soluble phosphoric acid is obtained when dry material is used, while in 1074 the undried material yields more phosphoric acid to water. This last is a superphosphate made from apatite.

SOLUBLE P₂O₅ BY 5 P.C. NH₄ cl.

The following table gives the results of using a 5 per cent solution of ammonium chloride, instead of water, to wash out the soluble phosphoric acid.

TABLE III.

Experiment.	1045.	1074.	1114.	1088.	1090.
21.....	5·75	7·25	2·23	7·42	6·02
22.....	5·93	6·96	2·83	.....	.....
23.....	.....	.....	2·78	.....	.....
Mean.....	5·84	7·10	2·53	7·42	6·02

SOLUBLE P₂O₅ BY ROTATOR.

The phosphoric acid dissolved in thirty minutes from two grams, by 100 cbc water, applied by means of the rotator, was as follows (in 1088 and 1090, 5 per cent solution ammonium chloride was used) :—

TABLE IV.

Experiment.	1045.	1074.	1114.	1088.	1090.
19.....	5·40	6·56	2·22	7·39	6·00
20.....	5·32	.....	.....	.....	.....
Mean.....	5·36	6·56	2·22	7·39	6·00

These experiments show that a 5 per cent solution of ammonium chloride may be used instead of water to dissolve phosphoric acid without materially affecting the results. The following synopsis of results, as far as soluble phosphoric acid is concerned, makes comparison easy.

SYNOPSIS.

SOLUBLE P₂O₅.

Method.	1045.	1074.	1114.	1088.	1090.
Official method on dry sample.....	5·80	6·53	2·21	.....	.....
" " normal sample.....	5·73	6·97	1·23	.....	.....
Ammonium chloride solution.....	5·84	7·10	2·53	7·42	6·02
Use of rotator, 30 min.....	5·36	6·56	2·22	7·39	6·00

REVERTED PHOSPHORIC ACID.

In the following series of experiments a solution of neutral citrate of ammonia (as per official instructions) was used to dissolve the so-called reverted phosphoric acid. In Experiments 14 to 18, inclusive, this was applied as directed by the official regulations; in Experiments 26 and 27 the solution was applied by the rotator during 30 min.; in 31 and 32 the solution of ammonium citrate was applied to the sample after treatment with solution of ammonium chloride to remove free lime.

REVERTED P₂O₅ BY AMMONIUM CITRATE.

TABLE V.

Experiment.	1045.	1074.	1114.	1057.	1128.	1088.	1090.
14	4·61	4·71	8·04	7·88	8·36	.....	.....
15	4·73	5·16	6·90	7·48	8·20	.....	.....
16	4·71	4·15	7·53	.....	.....	.....	.....
17	4·71	4·02	6·85	.....	.....	1·31	2·27
18	4·92	4·1	7·25	.....	.....	1·25	2·52
Mean.....	4·74	4·51	7·31	7·68	8·24	1·28	2·40
26	4·19	2·51	8·35	.....	.....	1·44	2·33
27	4·18	.....	.....	.....	.....	.....	.....
31 .....	.....	.....	.....	11·25	.....	.....	.....
32 .....	.....	.....	.....	11·25	.....	.....	.....

NOTES.—In Experiments 14 to 16, dry material was used, *i.e.*, residues from Experiments 7 to 9. In 17 and 18, residues from 10 and 11. In 26 and 27, residues from 19 and 20.

In the following series (Table VI.) a 2 per cent solution of citric acid was used to dissolve the reverted phosphoric acid. In 28 and 29, 200 cc. solution was used on the rotator for 30 min.; in 30, for one hour.

REVERTED P₂O₅ BY 2 PER CENT CITRIC ACID.

TABLE VI.

Experiment.	1045.	1057.	1128.
28	2·84	12·28	13·36
29 .....	.....	11·92	12·80
30 .....	.....	13·34	.....
	2·84	12·51	13·08

NOTES.—In 1057 and 1128 the free lime was previously removed by chloride of ammonium. In 1045 the soluble acid was removed by water.

In the following series (Table VII.) a 1 per cent solution of citric acid was employed, 200 cbc being used (except in Experiments 33 and 34), with the rotator, during periods varying from thirty minutes to two hours.

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REVERTED P₂ O₅ BY 1 PER CENT CITRIC ACID.

TABLE VII.—Results with 1 per cent Citric Acid.

Experiment.	1045.	1074.	1114.	1057.	1128.	1088.	1090.	Period.
21	4.91	1.45	10.60	12.55	12.43	2.97	4.49	200 cbc. applied for one hour, with the Rotator.
25	0.82	.....	12.62	12.45	3.08	4.53	
37.....	12.88	....	.....	.....
38.....	12.92	12.16	.....	.....
42	12.60	.....	.....	.....
Mean.	4.91	1.14	10.60	12.71	12.35	3.03	4.51	
35	13.36	12.64	.....	.....	One and a half to two hours.
39.....	12.64	....	.....	.....
40.....	12.84	11.96	.....	.....
Mean.....	12.95	12.30	....	.....
36.....	12.32	.....	.....	.....	One-half hour.
41.....	11.48	....	.....	.....
Mean.....	11.90	....	.....	.....
33	7.26	7.12	.....	.....	100 cbc.
34	8.64	....	.....	.....
Mean.	7.95	7.12	.....	.....

CONCLUSIONS.

The following conclusions seem to be justified by the work recorded :—

- 1. A variation of nearly 1 per cent of so-called ‘reverted’ P₂ O₅ occurs in applying the ammonium citrate method to different portions of the same sample in acid fertilizers. (See Table V.)
- 2. The application of 1 per cent citric acid to this class of fertilizers gives varying results. (See Nos. 1045, 1074 and 1114 in Table VII.) In 1045 the difference is negligible. In 1074 the citric acid is only one-fourth as effective as ammonium citrate ; in 1114 it is decidedly more effective.

It occurred to me that an explanation of this phenomenon might be found in the mode of occurrence of the phosphate of lime. I obtained the following results with a sample of Bone Meal (furnished by H. A. McNutt, Truro, N.S.):—

	Per cent.
Moisture	2.25
Water soluble P ₂ O ₅	0.10
Total P ₂ O ₅	21.91
Reverted P ₂ O ₅ —	
By neutral ammonium citrate.....	8.32
By 1 per cent citric acid.....	15.81

These results show citric acid to be a more effective solvent for reverted phosphoric acid in ground bones, and suggest the existence of bone meal in No. 1114. This is found to be the fact. No. 1074 is, on the contrary, a mineral phosphate. In this behaviour towards citric acid may lie a mode of ascertaining the origin of the phosphoric acid in a given fertilizer.

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ed from these slags by 100 cc. of a 5 per cent $\text{NH}_4 \text{Cl}$. solution, used cold, by mechanical agitation for one hour, is as follows :—

	No. 1057.	No. 1128.
Maximum	9·75	3·90
Minimum	7·30	3·90
Mean	8·28	3·90

The greatest variations observed in CaO removal, irrespective of the details of manipulation, are as follows:—

	No. 1057.	No. 1128.
Maximum.	10·75	5·00
Minimum	7·20	3·90
Difference	3·55	1·10

- The following general conclusions may be noted :—
- I. No important difference in the amount of soluble $\text{P}_2 \text{O}_5$ in acid fertilizers is obtained by the substitution of chloride of ammonium solution for water, as officially prescribed.
 - II. The substitution of 1 per cent citric acid for neutral citrate of ammonia in acid fertilizers brings about changes in the amount of $\text{P}_2 \text{O}_5$ dissolved, which seem to depend upon whether the phosphoric acid has come from a mineral or an animal source.
 - III. In basic slags a 5 per cent solution of ammonium chloride forms an effective solvent for the free lime, and does not dissolve $\text{P}_2 \text{O}_5$. It is a matter of indifference whether the solution be used hot or cold
 - IV. Citric acid of 1 per cent strength is practically as efficient a solvent of $\text{P}_2 \text{O}_5$ as a 2 per cent solution in lime free slags. Neutral citrate is somewhat less efficient, as shown by the following:—

	No. 1057.	No. 1128.
Mean $\text{P}_2 \text{O}_5$ by 2 per cent citric acid.....	12·51	13·08
“ by 1 “ “	12·80	12·16
“ by ammonium citrate.....	7·68	8·28
“ by 1 per cent citric acid applied for two hours.	12·95	12·30

I have the honour to be, sir,
Your obedient servant,
A. McGILL.

December 31, 1900.

MEMORANDA ON MANURES.

Since this bulletin is intended for circulation among our farmers, it has been thought advisable to take advantage of its issue by reprinting some of the notes which have appeared in former bulletins, and adding a few additional particulars from works which have recently appeared regarding the application of natural manures and artificial fertilizers.

It is nearly fifty years since Stoeckhardt, at that time professor in the agricultural school of Tharandt, Saxony, said that a farmer who bought guano, bonemeal, or other artificial fertilizers, and at the same time neglected to make proper use of the dung of the cattle on his own farm, must be regarded as an agricultural spendthrift. Every intelligent farmer in Canada will in these modern days agree with the old German professor, and maintain that the treasury of the farm is the dungstead, and that leaks and emanations from it of valuable fertilizing constituents must lead to financial embarrassment and possibly ruin

This statement may be positively made without in the slightest degree detracting from the merits of artificial fertilizers, for, when properly selected and applied, their value becomes abundantly evident. The question as to whether their use is remunerative has been frequently discussed, and depends to a large extent on the care employed in their selection. Supposing that the intelligent farmer has considered composition, cost, &c., to the best of his ability, made his selection and applied the fertilizer, he may still be in doubt as regards the result unless he takes steps to make a manure trial with it. As regards the best way of doing this, Hellriegel has related his experience. He recognizes how difficult it is for practical agriculturists, fully occupied with their regular work, and engaged in meeting all the difficulties caused by workmen, weather and market rates, to carry out regularly planned manure experiments. He therefore describes a method which experience in his estimation had justified, and recommends it for the purpose of ascertaining whether any application of lime, marl, dung or fertilizers had really produced the improvement which from the point of view of cost had been expected. This plan is to pass over, at one or several places, properly selected, a few square rods of the field without applying the dung or fertilizer. In this way unmanured plots, which do not require to be measured with great exactitude, but merely paced, and do not need to be harvested separately, are left in the manured field, by means of which any improvement in the latter may be remarked and valued.

This plan exacts that it should be possible to *see* a distinct difference between the unmanured plots and the manured fields, not only as regards the height and density of the resulting crop, but also in reference to the fullness of the ears and the development of the grains. In the event of such a distinct difference being invisible the manure is justly discredited as unfit for its intended purpose. It would seem advisable to recommend this plan to farmers who use fertilizers, because some of them may manure the whole field, fail to see any improvement on account of being unable to make comparisons, and perhaps condemn the fertilizer unjustly. The simplicity of the plan above described, and its applicability everywhere and every year would appear to commend it to the practical agriculturist. At the same time it is necessary to remark that there are instances on record of fertilizers having been applied and remaining utterly without effect owing to some defect in the soil. Such defects have often been cured by a previous application of marl or lime, which not only produced good effects themselves, but improved also the action of fertilizers applied afterwards.

THE CARE OF NITROGEN.

This element is the most valuable of fertilizing constituents, and one which is exceedingly liable to loss.

In many of the fertilizers described in this and former reports, their cost is very much increased by the admixture of nitrogenous constituents. This cost farmers might save by properly caring for the stock of nitrogen on their farms, and this stock might even be increased by cultivating those crops which have the power of appropriating the nitrogen of the atmosphere. Nevertheless the fertilizer manufacturers still seem to be under the necessity of supplying this element in considerable quantity in their goods, and of charging for it. In the case of the mixed fertilizers, this extra charge varies from \$8 to \$14 per ton, which the farmer must pay if he purchases, and which he can readily save in his own stables or produce upon his own farm.

Nearly the whole of the nitrogen in the fodder fed to farm stock is to be found in the excreta of the animals, and one-half of it is contained in the urine. It is further well known that 95 per cent of the potash contained in the food of cattle and sheep may be recovered by carefully saving the liquid manure only. It has, however, been ascertained that stable-yard manure experiences considerable loss of its fertilizing constituents, but more especially of nitrogen, when left to itself in the dung heap. According to the experiments of Wolff, this loss amounts to 55 per cent of the nitrogen contained in fresh manure from horned cattle. The later experiments of Heiden and Holdefleiss place it at 23.4 per cent. These results were obtained when ordinary reasonable care is taken of the manure, but give no data for estimating the loss which occurs when,

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as is very frequently the case in Canada, the manure is treated with the grossest neglect. It is safe to assume that, generally, 50 per cent of the nitrogen contained in the barn-yard manure of this country returns unutilized to the atmosphere, or is otherwise lost by careless treatment. Supposing that an average quantity of 36,000 pounds is produced in fresh condition annually by each animal, and that it contains 0.4 per cent of nitrogen, it follows that a loss of 72 pounds of nitrogen, worth \$8.64, takes place for each head of cattle. This loss can be prevented by daily strewing the stables with two pounds of ground plaster for each animal, which at once prevents any smell of ammonia from arising in the stable. The quantity prescribed means 700 lbs. or a cost of about \$2.50 annually for each 1,000 lbs. live weight, but, by adopting this plan, the farmer would to a great extent be relieved from the necessity of purchasing the nitrogen of artificial fertilizers.

In a pamphlet published by Vieweg 1859, entitled *Ein Pfund Stickstoff kaum einen Groschen*, which may be freely translated 'A pound of nitrogen for a penny,' Dr. Meyer Altenberg maintained that ground gypsum is the very best preservative of barn-yard manure when applied in the stable, because it secures 'certainty and completeness of effect, ease of execution, and the lowest possible cost.' He further described the effect of its application on the domain of Beberbeck in Hesse, and other impoverished farms, showing that it is possible to bring such into a fertile condition without the purchase of manure or fertilizers or feeding stuffs, excepting a little straw for bedding and oats for the horses.

TREATMENT OF STABLE-YARD MANURE.

Dr. Meyer-Altenberg, in the little work above mentioned, takes care to point out that the use of gypsum, without subsequent careful treatment of the dungheaps, does not give the desired effect, and he dwells on the importance of having the manure thoroughly trodden down, and made as compact as possible. This is also shown in Dr. J. Koönig's prize essay, 'How can the farmer preserve and increase the stock of nitrogen on his property?' (Berlin, 1887.) In a special chapter of this work the author discusses 'The evolution of free nitrogen during the fermentation and storage of stable manure,' describes the experiments which were made from 1860 to 1885 regarding its treatment and gives finally the results of the discussion from which the following sentences may be translated with advantage:—

1. In the decomposition of nitrogenous substances of every nature a loss, more or less considerable, of free nitrogen takes place.

2. This loss is the greater the more the atmosphere has access to the decomposing mass.

3. Too much moisture is just as hurtful as too little. Stable manure requires such a degree of humidity as permits its components to lie close to each other.

4. The addition of substances which fix ammonia (such as gypsum, kainite and kieserite) prevent or reduce the loss of nitrogen. *These substances are, however, of little or no value if care is not taken at the same time to prevent as much as possible the access of air.*

12. In storing stable manure in dungsteads the latter must be watertight and roofed in, and the treading down of their contents by the farm animals is to be recommended.

One thing in connection with this question is perfectly certain, and that is that the use of gypsum, or ordinary ground land plaster, prevents any loss of nitrogen in the stable, and while the manure is being forwarded to the dungheap. Further, if the work from which the foregoing quotations have been made be carefully studied, and also the experiments and writings of Holdefleiss, Vogel and others, it appears to be quite certain that the use of the same article, or of the gypsum produced in the manufacture of 'acid-phosphate,' completely prevents the loss of ammonia from the liquid part of the manure, and also from the organic nitrogen of the solids, provided the whole has, previous to fermentation, been made thoroughly compact, and atmospheric air almost completely excluded. Where it is found impossible to attend to the latter precautions, the

safest way will probably be found to lie in avoiding fermentation altogether, by conveying the fresh manure, after treatment with gypsum, on to the field to be manured and bringing it under the soil as rapidly as possible. The latter practice has been proved to be most advantageous by the experiments which have been carried on for some time past at the Central Experimental Farm by Director Saunders. (See Reports for 1898.)

Not only has the addition of substances which have the faculty of fixing ammonia been recommended for stable manure, but its improvement to a greater extent has been proposed by the addition of fertilizers. The following quotation is taken from Bulletin No. 45 (for March, 1897) of the Massachusetts Agricultural College, and was written by Dr. C. A. Goessman, Chemist for that institution :—

‘The practice of adding to the manurial refuse materials of the farm as stable manure, vegetable compost, &c., such single commercial manurial substances as will enrich them in the direction desirable for any particular crop to be raised, does not yet receive that degree of general attention which it deserves. (The italics are in the original.) An addition of potash in the form of muriate or sulphate of potash, or of phosphoric acid in the form of fine ground South Carolina or Florida soft phosphate, &c., will in many instances not only improve their general fitness as complete manure, but quite frequently permit a material reduction in the amount of barn-yard manure ordinarily considered sufficient to secure satisfactory results.’

‘Average composition of seventy-five samples of barn-yard manure :—

	Per cent.	Lbs. per ton.
Moisture.....	67·00	1,340·0
Nitrogen	0·52	10·4
Potassium Oxide.....	0·56	11·2
Phosphoric Acid.....	0·39	7·8

‘The average barn-yard manure contains, it will be noticed from the above statement, a larger percentage of nitrogen, as compared with its potash and phosphoric acid than is generally considered economical. An addition of from thirty to forty pounds of muriate of potash, and of one hundred pounds of fine ground natural phosphate (soft Florida or South Carolina floats) per ton of barn-yard manure would greatly increase its value as an efficient and economical general fertilizer.’

These are no doubt most excellent suggestions, and there is no reason why these substances should not be introduced into the stable manure in the same manner as in the case of the ground plaster above mentioned. Plain superphosphate and kainite might also be used, some of the constituents which would be useful in fixing the ammonia, as soon as formed from the organic nitrogen. Should this suggestion be found to have practical value, there is no doubt that our fertilizer manufacturers would be found able to supply our farmers, at a moderate cost, with a mixture of ground plaster, superphosphate and kainite, in such proportions as experience might show to be most advantageous. No better application can be made of the wood ashes produced in the farmer’s household than by mixing them with the barn-yard manure, and most excellent results are known to have followed this practice.

ACQUISITION OF NITROGEN.

Not only can the farmer save almost the whole of the nitrogen contained in the fodder fed to his cattle, but he can actually increase the stock of it stored away in his fields, agricultural products and manure heaps, by a judicious course of crop rotation. For more than a century agricultural chemists have discussed the question as to whether free atmospheric nitrogen can be assimilated by plants, but it may now be regarded as perfectly settled in the affirmative, if regard is had only to the plants of the order leguminosæ, such as beans, pease, lentils, vetches, clovers, alfalfa, serradella, &c. Even the great English agriculturists, Sir J. B. Lawes and Sir Henry Gilbert, who had previously been of an opposite opinion, have now admitted that this appropriation of nitrogen has been completely proved. This acknowledgment was made by Sir Henry Gilbert, at a great meeting of agricultural chemists held at Halle, in Germany, in September, 1891.

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Thus, modern research has confirmed not only modern agricultural practice, but also the experience of antiquity, for Prof. W. Strecker has pointed out a passage in Pliny which says: 'Lupines require so little manure that they, in fact, replace it; vetches make the land more fertile. Corn should be sown where previously lupines or vetches have stood, because they enrich the land.'

It is not, however, to be supposed that this utilization of atmospheric nitrogen by leguminous plants can take place upon very poor soils or upon those destitute of the inorganic constituents which they require. The latter must in such cases be supplied in the shape of potash with some phosphoric acid, as was done with great success by Schultz, of Lupitz, a practical agriculturist in North Germany. In fact, had it not been for his investigations, the controversy above referred to might have continued without results up to the present hour.

Professor König, of Münster, gives the following summary of Schultz's experience:—

'Schultz acquired the farm Lupitz in the year 1855; its soil consisted of a poor, cold diluvial sand; the profit in working it was very small. Lupines yielded, indeed, as a fodder tolerable results, but when used as green manuring for rye and oats, no return was obtained from them. The application of artificial manures produced good crops, but they did not pay; burnt lime showed itself to be too heating. The use of manure was more favourable, especially when fertilizers containing phosphoric acid were used at the same time. But at the best the total result was not satisfactory.

'Shortly after Schultz acquired Lupitz, the great discovery of potash salts was made, and about 1860 they began to be produced from the mines of Stassfurth. Schultz made up his mind to try them as manure and he obtained the most surprising results. After lupines had shown themselves to be useless as forerunners of grain, they were excluded from the rotation and grown on a separate field without any manuring and alternating with sheep pasture. But the harvest on these became worse and worse until the field in question became quite lupine "sick." Schultz made his first trial on this field, manuring it with 300 pounds kainite per morgen (1 Prussian morgen = 0.631 acre); the sickness was at once cured, and for twenty-five years afterwards Schultz has grown lupines on this ground without interruption, always with the application of 300 pounds kainite. Schultz obtained similar good results on the ground which had received the marl, by the application of potash salts. This ground had indeed yielded well with lupines for two years after the application of the marl, but in the third year they sickened here too. When, however, 300 pounds kainite were applied here and ploughed in the fall, the ground was cured, although an application of phosphates had not produced the desired results.

'The favourable influence which the manuring with kainite or potash salts had exerted on lupines induced Schultz to try them on grain, in conjunction with phosphates. But in this case he obtained contradictory results according to the nature of the crops which preceded the grain. For instance, while grain sowed after lupines and manured with potash and phosphates yielded very good and remunerative harvests, these were not to be obtained if grain was grown after grain or after potatoes. This behaviour of these crops was explained by Schultz in this way: that lupines as deep-rooted plants leave in the soil after harvest a residue of root, in which a considerable amount of nitrogen has accumulated, an amount sufficient to supply the wants of the following grain crops; that, on the other hand, the application of potash and phosphates to grain, after a preceding grain crop, is without effect, for the reason that the latter had consumed the stock of nitrogen. Grain crops always reduce this stock; never increase it. Schultz has given the name "nitrogen collectors" to the lupines and similar plants, while grains are called "nitrogen consumers." His system of rotation is therefore the following:—Sow first nitrogen collectors (lupines, pease, beans, vetches, clover, lucerne, serradella, &c.) or, as they have been called, renovating crops, and give them 300 lbs. kainite per morgen, with perhaps an addition 20 lbs. phosphoric acid. After harvesting the nitrogen collectors, sow a nitrogen consumer, raising a grain or exhausting crop, giving it also 300 lbs. kainite and 20 lbs. phosphoric acid. The grain crop is perfectly successful, because the first crop left behind it nitrogen enough to supply the wants of the grain. In this way the keeping of stock, which is expensive on a poor sandy soil, can be reduced and the

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purchase of nitrogenous fertilizers dispensed with, because the nitrogen collectors are able to stock the soil with that valuable element.'

The foregoing description is taken from Professor Konig's '*Stickstoff Vorrath*,' published in 1887 (Paul Parey, Berlin). It was in 1884, nearly thirty years after the purchase of his sandy farm, that Schultz, of Lupitz, published the results of his experience, although they did not contain anything very new and although they only confirmed experiences still older than his own. But his case was surprising and his explanation of the cause of his successful farming challenged the attention of scientific agriculturists. The consequence has been the issue of many pamphlets on the subject, and an activity in the region of agricultural experimenting which is not yet ended. Atwater, Wagner, Heiden, Hellriegel, and many others have participated in these investigations, and Professor Wood, of the Storrs Agricultural School in Connecticut, has given the following general conclusions as the result of the work :—

1. 'Pease, alfalfa, serradella, lupine, clover in all probability, and apparently leguminous plants in general, are able to acquire large quantities of nitrogen from the air during their period of growth.

2. 'There is scarcely room to doubt that the free nitrogen of the air is thus acquired by plants.

3. 'That there is a connection between root tubercles and this acquisition of nitrogen is clearly demonstrated. What this connection is, what are the relations of micro-organisms to the root tubercles and the acquisition of nitrogen, and in general how the nitrogen is obtained are questions still to be solved.

4. 'The cereals with which the experiments have been completed have not manifested this power of acquiring nitrogen, nor do they have such tubercles as are found on the roots of legumes.

5. 'In the experiments here reported, the addition of soil infusions did not seem necessary for the production of root tubercles. A plausible supposition is that the micro-organisms or their spores were floating in the air and were deposited in the pots in which the plants grew.

6. 'As a rule the greater the abundance of root tubercles in these experiments, the larger and more vigorous were the plants and the greater was the gain of nitrogen from the air.

7. 'In a number of these experiments, as in similar ones previously reported, there was a loss of nitrogen instead of gain. The loss occurred where they were no root tubercles; it was especially large with oat plants, and largest where they had the most nitrogen at their disposal in the form of nitrates. As the gain of nitrogen by the legumes helps explain why they act as renovating crops, the loss in the case of the oats suggests a possible reason why they should appear to be an exhausting crop.

'Practical inferences:—'The ability of legumes to gather nitrogen from the air helps to explain the usefulness of clover, alfalfa, pease, beans, vetches and cow pease as renovating crops, and enforces the importance of these crops to restore fertility to exhausted soils. The judicious use of mineral fertilizers (containing phosphoric acid, potash and lime) will enable the farmer to grow crops of legumes which, after being fed to his stock, will, with proper care to collect and preserve all manure, both liquid and solid, enable him to return a complete fertilizer in the shape of a barn-yard manure to his land. A further advantage of growing these crops is that the nitrogenous material, protein, which they contain in such great abundance, is especially valuable for fodder.'

From the foregoing it seems that, in the present condition of our knowledge, the conclusion may be drawn that the atmosphere stands ready to furnish the farmer, gratis, with all the organic constituents which his crops require, provided always that he, on his part, will exercise a sufficient amount of skill and intelligence in appropriating and retaining on his farm the fertilizing materials, and especially the nitrogen. If he does this, all that is necessary for him to provide, in order to replace the losses which his farm sustains from the sale of stock or produce, are the inorganic or mineral constituents of these, and especially the phosphoric acid and potash. There is much in all this to remind one of Sprengel and Liebig's teaching of fifty years ago, according to which a plant cannot thrive if its soil does not contain all the substances which are to be found in its ash.

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UTILIZATION OF SEWAGE.

The losses in fertilizing material which are sustained, as above mentioned, on account of the neglect or unscientific treatment of barn-yard manure, are very trifling when compared with those which the community suffers in the almost total loss of the nitrogen, phosphoric acid and potash contained in human excreta. The utilization of such always becomes a subject for discussion when the question is raised as to how a cheaper class of manures than the artificial fertilizers can be obtained for use in agriculture.

Where the water carriage system of removing sewage and excrement has been introduced, nothing is to be hoped for in the recovery of their fertilizing constituents. Even in cases where, at large expense, establishments have been erected for the treatment of sewage by precipitation or similar methods, the products have been found to be entirely destitute of agricultural value. The greater part of the fertilizing constituents of sewage are in such a soluble condition, and have been diluted with water to such an extent, as to render their recovery economically impossible. It has been attempted in the neighbourhood of many cities in England and on the continent of Europe to use the sewage for irrigation and as liquid manure, but this method of utilization has been found to be in the highest degree imperfect. At Berlin it has been proved, that of the nitrogen contained in its sewage, at the very most only 13·8 per cent is found in the agricultural products of all the magnificent farms irrigated by it in the neighbourhood of the city. When the use of water for removing house refuse is excluded, and ordure and urine are removed as manure in their natural state, their utilization is possible, and is made a source of revenue in such towns as Stuttgart, Groningen, Greifswald, &c. But the systems of this class which are in use have all their disadvantages, as is proved by the tendency which municipal authorities constantly show to adopt the water carriage system. The greatest disadvantage under which these systems labour is the difficulty caused by the offensiveness to the sight and smell of the material with which they have to deal. This has been entirely met by the use of moss litter as an absorbent, deodorizer, and disinfectant.

MOSS MANURE.

The first public mention of the usefulness of moss litter as a deodorizer and absorbent seems to have been made by Dr. Ludwig Happe, in Braunschweig, in December, 1880, since which time its application for the purpose has gradually increased until now, when the system has been introduced into several towns in Germany, and is also practised in Congleton, Cheshire, England. In Canada this method of deodorizing human refuse has been in use for years at Caledonia Springs. It, of course, at once recalls the dry earth system, regarding which great expectations were at one time entertained. The advantages of moss litter over dry earth for the purpose in question are, however, very decided. They consist in the perfect inoffensiveness of the moss litter product, in the fact that one part of moss litter will deodorize and dry at least six parts of mixed excreta, and in the greater agricultural value of the resulting manure. Dry earth (which is required in quantity at least equal to that of the excreta) is valueless from an agricultural point of view, but this is not the case with moss litter, which as analyses show, often contains as much nitrogen as ordinary barn-yard manure. Numerous analyses have been made of moss litter manure as produced in Germany, and its average contents from seven different towns may here be stated.

	per cent.	lbs. per ton.		Value per ton.
Nitrogen.....	0·664	13·28	at 13c.	\$1 72
Phosphoric acid	0·350	7·00	5	0 35
Potash	0·285	5·70	5¼	0 30
Water	83·00			\$2 37

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Numerous trials have been made on various crops with this manure, and very satisfactory results are always reported. In all cases it is stated to excel barn-yard manure even when the latter is used in much greater quantity.

Canada possesses in its bogs and swamps inexhaustible quantities of moss litter, which is frequently found in beds several feet in thickness lying above the peat. The following tests have been made in the Inland Revenue Laboratory of moss litter from various localities in the Dominion :—

	Moisture.	Ash.	Nitrogen.
	per cent.	per cent.	per cent.
Moss Litter, Berwick, N.S.	14.40	1.16	1.26
Black Muck, "	13.30	3.68	1.58
Moss from Great Village, N.S.	63.44	3.46	0.63
Sphagnum moss from Shippegan, N.B.	12.45	1.55	0.55
Light coloured moss litter from Lincoln Parish, N.B.	11.55	1.40	1.79
Dark coloured sample from the foregoing locality.	10.95	0.80	1.06
Moss litter from Musquash, N.B., upper layer	11.50	0.95	0.82
Moss litter from same locality, lower layer	12.50	0.90	0.72
Peat from St. Bridget, Province of Quebec.	13.30	2.50	1.48
Peat from St. Hubert, Quebec.	12.35	2.68	1.84
Light coloured moss litter from Caledonia Springs.	10.00	1.60	2.95
Dark coloured moss litter from same locality..	11.60	2.70	2.26
Peat from the same locality.	10.95	3.90	2.94
Surface moss from the Mer Bleu at Eastman's.	10.85	2.80	0.71
Surface moss from the Mer Bleu at Baldwin's Farm..	7.90	2.66	1.47
Surface moss from the Mer Bleu at Baldwin's Farm, 18 inches deep.	27.90	1.72	1.64
Peat from Mer Bleu at McFadden's Farm, wide ditch, Navan.	22.60	4.40	2.21
Peat from Mer Bleu, McFadden's Farm, narrow ditch, Navan	9.40	6.62	2.80
Peat from near Stratford, Ont.	16.80	9.10	1.91
Hypnum moss from near Stratford, Ont.	8.75	9.72	2.01
Moss litter from bog in Welland County, Ont.	3.85	4.70	1.51
Peat lying underneath the foregoing.	5.30	4.85	1.41
Peat from same locality, lying 4½ feet below surface	3.25	41.25	1.52
Peat from Dobson's bog near Beaverton, Ont.	18.42	9.04	1.89

The manufacture of moss litter has been attempted at Musquash, in New Brunswick, and it is now being produced in Welland County, Ontario. From the latter locality I was supplied with several bales of the moss litter for experimental purposes, and Dr. Laberge, of Montreal, undertook to superintend the carrying out of an experiment to determine its deodorizing and absorbent qualities. He reports that 100 lbs. of moss litter were sufficient for drying 800 lbs. of ordinary excreta from privy pits in Montreal, and rendering it entirely inoffensive. A sample of the product remained for days in my office without attracting notice and indeed it was quite devoid of odour. Its analyses gave the following results :

	p.c.	lbs. pr. ton.	Value per ton.
Nitrogen.....	1.31	26.2 at 13c.	\$3 41
Phosphoric acid.....	0.90	18.0 " 5	0 90
Potash.....	0.14	2.8 " 5¼	0 15
Water.....	65.47		\$4 46

The valuation of ordinary fresh barn-yard manure with 75 per cent of water is about \$2 per ton ; with 67 per cent, water as in the case of the average given above by Dr. Gossmann, the value is nearly \$2.25. Therefore, much better results might be expected agriculturally from a "moss manure" of the composition just described.

Moss litter might also be applied with great advantage in public urinals. When a sample of it was supersaturated with urine and dried, and this process repeated several times, no offensive odours were developed and the product was found on analysis to contain 12.41 per cent of nitrogen which is equal to a valuation of \$32.26 per ton.

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These facts are reported in order to show that Canada possesses in her waste lands abundance of material which might be used in our towns and villages for the production of a very valuable manure, with the simultaneous introduction of very many sanitary advantages. It is not to be expected that cities or towns which are advantageously situated for the water carriage system, or which have already adopted it, will make any changes, but there are many towns and villages in the Dominion where the application of the moss litter system would be very suitable, and the authorities of which, by selling the product or giving it gratis to the farmers of the neighbourhood, might confer a great benefit on agriculture.

APPENDIX N.

BULLETIN No. 76.—CANNED SALMON.

OTTAWA, July 2, 1901.

W. J. GERALD, Esq.,
Deputy Minister of Inland Revenue.

SIR,—On March 13, 1900, I addressed a report to the Commissioner on the subject of canned goods, which was not published at the time. I would respectfully suggest that its contents, repeated in this report, should now be made public, and at the same time the particulars given concerning a collection of samples of canned salmon since made.

In December, 1899, a circular was, with the Commissioner's approval, issued to almost all the physicians of the Dominion, accompanied by a schedule, in which these gentlemen were requested to state their experience as regards the use of canned goods. The circular and schedule in question are here transcribed :—

DEPARTMENT OF INLAND REVENUE,
OTTAWA, November 18, 1899.

DEAR SIR,—The attention of this department has been called to the frequency with which illness, attributed to the use of canned or tinned foods, is noted in the various daily and weekly newspapers of Canada.

The use of such foods is on the increase, and it is very desirable that the facts as to this matter should be known so that necessary steps may be taken to safeguard the health of consumers.

To this end copies of this circular and schedule are being sent to the medical men of Canada. Will you kindly give them your best attention, and make the returns as carefully as your time will permit, so that the statistics obtained may be full and satisfactory. I shall be much obliged by your returning the schedule not later than the end of the present year, using the accompanying envelope so as to avoid out-lay for postage.

Yours truly,
E. MIALl,
Commissioner.

SCHEDULE.

To Dr.

.....

1. Have any cases of illness, apparently attributable to the uses of tinned foods, come under your notice within recent years?

.....

2. Please state the number of such cases, and the period of your observation. years.

3. How many have terminated fatally?

.....

4. Have you judged the symptoms to point to metallic or to ptomaine poisoning?

.....

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5. If the latter, was the defect owing to imperfect sealing of the tins, or to slight change or decomposition in the contents on account of age?

.....
6. Have you any suggestions to make with a view to bettering existing conditions as regard tinned foodstuffs?

(Signature).....

Date.....
.....

The number of circulars and schedules sent out to the medical men of the different provinces of the Dominion was 4,348. Of these 263 were returned from the Dead Letter office as not called for, &c. To the latter number must be added thirty schedules returned blank, owing to the death or removal of the parties to whom they were addressed, or for other reasons, and two from the United States. The total number received of schedules which were properly filled up was 1,313. Adding these to the 295 just mentioned, and deducting them from the total number of circulars issued, it appears that 2,740 of the latter were sent out to which no answer of any kind was returned.

The principal question in the schedule which was answered either affirmatively or negatively was as follows: ‘Have any cases of illness, apparently attributable to the use of tinned foods, come under your notice within recent years?’ Classified according to the answers given to this question and by provinces, the 1,313 schedules above mentioned as having been filled up, show as follows:—

From	‘Yes.’	‘No.’	Total.
Prince Edward Island.....	5	13	18
Nova Scotia.. ..	27	77	104
New Brunswick.	10	74	84
Quebec.....	66	322	388
Ontario.....	112	466	578
Manitoba.....	15	38	53
North-west Territories.....	9	9	18
British Columbia	10	60	70
	254	1,059	1,313

Of the total number of replies received, 19·3 per cent were therefore in the affirmative.

With reference to the negative replies, it has to be reported that the great majority of the physicians give these without comment. Some add remarks indicating scepticism as regards the prevalence of the cases of illness in question, and others state that nothing of the kind has come under their notice, although canned goods are very generally used in their districts. On the other hand, many evidently believe in the occurrence of such cases outside of their own experience, because they account for the absence of cases by the fact that tinned foods are not generally used in their neighbourhood, or that they discourage their use, and a great many offer suggestions (in response to query No. 6) as to the precautions to be used in the packing, storing and use of such articles. Among these suggestions, the following may be mentioned:—

- 1. The factories and the foodstuffs to be canned should be subject to inspection so as to ensure cleanliness in the former and good condition of the latter. The use of muriate of tin, chloride of zinc or acid should not be permitted in soldering. After sealing, the tins should be inspected.
- 2. Imported canned goods should also be subject to inspection.
- 3. Vessels of glass or earthenware should be used instead of tins or cans.
- 4. The date of filling and the name of the factory and its proprietor should be stamped on the tin itself.

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5. Printed warning should be given on the label of each tin against allowing any of the contents to remain in it after opening and against using the contents if it has any unusual taste or smell, or the can shows any other indications of decomposition. These indications should be described on the label. The purchasers should also be advised to have the contents used up within 24 hours after opening.

6. The sale of canned goods should be prohibited after a certain lapse of time from the date of their manufacture. The periods suggested vary from six months to two years.

7. Canned goods should be kept in cold storage and never stored on grocer's shelves or exposed to the sun's rays or any high temperature. Such treatment of canned goods should be prohibited by law.

It is necessary to note that, among these negative answers, there are to be found very decided statements that the writer has never met with any cases of illness from the use of canned goods during a very long period of practice. There are also warnings against embarrassing the canned goods manufacturers with foolish restrictions, and remarks to the effect that the industry itself is of the greatest importance to the country, and an immense boon and advantage to the consumer. The canning system is said on the whole to be excellent, and to be constantly improving.

Referring now to the affirmative replies, it must be said that the figures and details which they contain do not lend themselves to exact classification. In stating the number of cases it is often done indefinitely, and sometimes the words, 'several' and 'a few' are used. Quite frequently no number at all is stated, no notes or record having been kept. The number of cases actually given amounts to 970 for the whole Dominion. The 'period of observation' sometimes means the whole time during which the physician has been practising, and in many other cases it extends back only a year or two. The average period I find to be seven years. The number of cases of disease apparently attributable to the use of tinned goods would therefore average about 138 per annum in the whole of Canada.

The total number of cases which terminated fatally amounted to 15 in the above mentioned average period.

In reply to query No. 4, the answers are also indefinite, but interpreting them reasonably, about 70 p.c. of the cases are attributed to ptomaine and 30 p.c. to metallic poisoning. As to the cause of the poisoning a great many of the medical men are candid enough to say that they don't know. On the other hand numerous opinions have been expressed and among the causes to which the illnesses have been attributed the following are mentioned in the order of frequency:—I. The contents of the tin are said to have been too old. II. The contents were exposed too much to air after opening, and without being transferred to another vessel. III. Imperfect exclusion of air previous to opening. IV. Unsound character or inferior quality when originally packed.

In response to query No. 6, the suggestions made are of the same nature as recorded above in connection with the negative answers, and the following are given in addition:—

8. Screws should be used in securing the boxes in which the tins are packed as ordinary nails sometimes happen to be driven through the tins causing access of air.

9. Vessels of porcelain or 'fibre' are suggested as substitutes for tin plate, also wood with an impervious coating.

As regards the conclusions which might be drawn from the inquiry, there appeared to be a unanimity of opinion, among the majority of the physicians who made returns, that the time of filling (month and year) and name of the manufacturer or canning factory should be stamped on the tins, and that this should be secured by legal enactment.

A few months after the foregoing report was made some statements appeared in a Canadian newspaper to the effect that canned salmon of bad quality was not unfrequently offered for sale in our markets. The attention of the department was specially called to these statements, which were in the form of editorial articles, and in consequence a collection of samples of canned salmon was ordered to be made in June of last year, and submitted to the district analysts. The subjoined tabular statement shows

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the results of their examination. In all 100 samples were collected over a wide extent of country and in the following places :—

	No. of Samples.		No. of Samples.
Halifax, N.S.....	8	Ottawa.....	10
St. John, N.B.	8	Toronto.....	4
Quebec.....	4	St. Catharines, Ont.....	4
Montreal.....	5	Clinton, Ont.....	2
Three Rivers.....	3	Goderich, Ont.....	2
Drummondville... ..	2	Hensall, Ont.....	2
St. Anne de Beaupré.....	2	Exeter, Ont.....	2
Richmond, P.Q.....	3	London, Ont.....	2
Granby, P.Q.....	4	Winnipeg, Man.....	12
Hull, P.Q.....	2	Vancouver, B.C.....	11
Farnham, P.Q.....	2	New Westminster, B.C.....	1
Aylmer, P.Q.....	2		
St. Hyacinthe, P.Q.....	3	Total.....	100

It will be observed from the table that traces of metallic contamination were found in about one-half the number of samples. These traces do not, however, indicate anything to which exception can be taken, and even in the cases where 0.0009 p. c. and 0.0012 of lead were detected it is doubtful whether such very small quantities are injurious to the consumer. This matter has been discussed in part 8 of Bulletin No. 13, U.S. Department of Agriculture, but no conclusions seem yet to have been reached regarding the limits to be recommended as allowable in cases of metallic contamination. In 1892 the Italian Government amended the food law of that country so that amounts of copper not exceeding 100 millegrammes per kilo. are to be allowed in green preserved vegetables. This means 100 parts per million, while the quantities above mentioned of lead are only 9 and 12 parts per million, respectively.


No addition of preservatives was discovered in any of the samples. The table also shows that not one of them has been challenged as unsound, unfit for food or calculated to be injurious to the consumer. Only three samples are mentioned as having an objectionable odour, one of these being very bad and two samples are characterized as stale. Thus only 5 per cent at most of the samples collected were found to be in any degree doubtful so far as quality is concerned. On the whole, the examination shows that there is nothing in the canned salmon trade to justify the newspaper articles above referred to.

I beg to recommend the publication of this report.
I have the honour to be, sir,
Your obedient servant,

THOMAS MACFARLANE,
Chief Analyst.

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STATEMENT of the Results of Examining

No. of Sample.	Date of Collection.	Quantity Purchased.	Cost.	NAME AND ADDRESS OF		
				Name or Brand.	Vendor.	Packer as shown on Label.
	1900.		\$ cts.	<i>Official Analyst, M. Bowman, Halifax, N.S.</i>	<i>Halifax, N.S.</i>	
16780	June 26..	3 cans..	0 36	'Fresh Fraser River.'	J. P. Buckley, Lower Water St.	
16781	" 26..	" ..	0 45	'Victory' .. .	F. Fleming, Pleasant St.	McPherson & Hickey, Vancouver.
16782	" 26..	" ..	0 36	'Drysdale' .. .	R. F. Forristall, Birmingham St.	Canoe Pass Canning Co., Fraser River, B.C.
16783	" 26..	" ..	0 45	'Drysdale' .. .	V. Grant, Rottenburg St.	" ..
16784	" 26..	" ..	0 38	'Viceroy' .. .	R. Urquhart & Son, Spring Garden Rd.	B.C. Canning Co., Victoria
16785	" 26 ..	" ..	0 45	'Skeena River' .. .	W. J. Hopgood, Spring Garden Rd.	Skeena River Packing Co., Victoria, B.C.
16786	" 26..	" ..	0 45	'Laurel' .. .	" ..	Anglo B. C. Packing Co., Victoria.
16787	" 26..	" ..	0 36	'Corn Flower' .. .	Crockett & Co.	" ..
					<i>St. John, N.B.</i>	
17716	" 19..	" ..	0 36	'Capital' .. .	W. F. Hatheway, 17 South Wharf.	Victoria Canning Co., B.C.
17717	" 19..	" ..	0 36	'Arbutus' .. .	Northrup & Co., 23 South Wharf.	" ..
17718	" 19..	" ..	0 34	'Royal Club' .. .	Merritt Bros., Ward St.	B. C. Canning Co ...
17719	" 19..	" ..	0 60	'Golden Crown' .. .	Baird & Peters, 16 Ward St.	W. S. Loggie & Co., Chatham, N.B.
17720	" 20..	" ..	0 30	'Brand E' .. .	G. S. De Forest & Sons, 9 North Wharf.	West Coast Fishing and Trading Co., B.C.
17721	" 20..	" ..	0 45	Sterling .. .	Bowman & Angevine, 28 Water St.	Lowe Inlet Packing Co., Victoria, B.C.
17722	" 20 ..	" ..	0 35	'Chieftain' .. .	Gilbert Bent & Son, 5 South Wharf.	English Packing Co , B.C.
17723	" 20..	" ..	0 40	'Queen' .. .	G. M. & A. A. Barker, 100 Princess St.	British American Packing Co., B.C.
				<i>Official Analyst, Dr. M. Fiset, Quebec.</i>	<i>Drummondville, Que.</i>	
19936	" 22 ..	" ..	0 36	'Warrior' .. .	D. Hebert .. .	Pacific Packing Co .. .
19937	" 22..	" ..	0 45	'Laurel Wreath' .. .	J. N. Turcott .. .	Anglo B. C. Packing Co., Ltd.
					<i>Montreal.</i>	
19938	" 22 ..	" ..	0 45	'Horse Shoe' .. .	Jos. Beauchamp, 149 Vitre St.	Richmond Canning Co., Victoria, B.C.
19939	" 22 ..	" ..	0 30	'Ocean' .. .	" ..	Malcolm & Windsor, Steveston, B.C.
					<i>Three Rivers, Que.</i>	
19940	" 25..	" ..	0 38	'Sunflower' .. .	Duval & Bellefeuille, 41 Desforges St.	North Coast Packing Co..
19941	" 25..	" ..	0 38	'C' in  .. .	U. Carignan, 134 Desforges St.	Harlock Packing Co.....
19942	" 25..	" ..	0 38	" .. .	O. Carignan et fils, 148 Desforges St.	Skeena Packing Co.

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100 samples of Canned Salmon.

RESULTS OF ANALYSIS.						Condition of Fish and Colour, &c.	No. of Sample.	Official Analysts Remarks.
Metallic Contamination.				Preservatives.				
Copper.	Lead.	Tin.	Iron.	Borax.	Salicylic Acid.			
.....	None.....	.....	.....	.....	None...	Pale in colour but sound ; tin bright except a few dark spots.	16780	Unadulterated.
.....	" .....	.....	.....	.....	" ...	Pale in colour but sound ; tin very slightly blacken'd	16781	"
.....	" .....	.....	.....	.....	" ...	Fish good ; tin bright with a few dark spots.	16782	"
.....	" .....	.....	.....	.....	" ...	Fish good ; tin showed a few dark spots.	16783	"
.....	" .....	.....	.....	.....	" ...	" ..	16784	"
.....	" .....	.....	.....	.....	" ...	Fish good; tin bright except slight blacken'g on bottom	16785	"
.....	" .....	.....	.....	.....	" ...	Fish good ; tin bright.....	16786	"
.....	" .....	.....	.....	.....	" ...	Fish good ; tin slightly darkened on one side.	16787	"
.....	" ..	.....	.....	.....	" ...	Fish good; tin bright except a few dark spots.	17716	"
.....	" .....	.....	.....	.....	" ...	Fish good ; tin blackened on one side.	17717	"
.....	" .....	.....	.....	.....	" ...	Fish good ; tin bright, no spots.	17718	"
.....	" .....	.....	.....	.....	" ...	Fish good; tin bright except slight blacken'g near seam	17719	"
.....	" .....	.....	.....	.....	" ...	Fish good; tin bright except a few dark spots.	17720	"
.....	" .....	.....	.....	.....	" ...	Fish good ; a very few spots on tin.	17721	"
.....	" .....	.....	.....	.....	" ...	" ..	17722	"
.....	" .....	.....	.....	.....	" ...	Fish sound but rather soft ; Tin slightly blackened on bottom.	17723	"
.....	" ...	None...	Trace ..	.....	" ...	Taste and smell good, colour rather pale, sound and pretty firm.	19936	Genuine.
.....	.....	Present.	Present.	.....	" ...	Taste and smell good, sound and firm, colour very pink.	19937	"
.....	Trace ..	.....	" .....	.....	" ...	Taste and smell good, sound and firm.	19938	"
.....	.....	Present.	" .....	.....	" ...	Peculiar smell, very pale in colour, not very well pre- served.	19939	"
.....	Traces..	" ..	" .....	.....	" ...	Taste and smell good, pale in colour, sound and pretty firm.	19940	"
.....	Non ...	None...	"	" ...	Taste, smell and colour good, sound and firm.	19941	"
.....	Trace ..	Present.	"	" ...	" ..	19942	"

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STATEMENT of the Results of Examining

No. of Sample.	Date of Collection.	Quantity Purchased.	Cost.	Name or Brand.	NAME AND ADDRESS OF	
					Vendor.	Packer as shown on Label.
	1900.		\$ cts.	<i>Official Analyst, Dr. M. Fiset, Quebec.</i>	<i>Ste. Anne de Beaupré.</i>	
19943	June 26..	3 tins..	0 45	'Sovereign'	E. Forest & Co., Main St.	Anglo B. C. Packing Co..
19944	" 26..	" ..	0 45	'Eaglé'	Louis Morel, Main St.. <i>Quebec.</i>	Victoria Packing Co.....
19945	" 26..	" ..	0 35	'Tulip'	S. P. Brosseau, 320 St. Paul St.	Anglo B. C. Packing Co..
19946	" 26..	" ..	0 45	'Red Cohoe'	L. T. Demers, Champlain Market.	Thos. Earle, Victoria, B.C.
19947	" 26..	" ..	0 39	'Viceroy'	A. Convey, 97 Saint Matelot.	B. C. Canning Co.....
19948	" 26..	" ..	0 45	'Capital'	C. Lavoie, 155 Bridge St.	Victoria Canning Co. ...
					<i>Richmond, Que.</i>	
19949	" 27..	" ..	0 45	'Queen'	K. McRae, Main St...	British American Packing Co.
19950	" 27..	" ..	0 45	'Queen Charlotte' ..	Desmarais Bros., Main St.	B. C. Canning Co.....
19951	" 27..	" ..	0 38	'Blue Jacket'	Jas. Pilgrim.....	English Bay Canning Co..
				<i>Official Analyst, Dr. F. X. Valade, Ottawa.</i>	<i>Ottawa.</i>	
20711	" 20..	2 " ..	0 30	'Queen Charlotte' ..	C. Moreland, Sparks St	B. C. Canning Co., Victoria, B.C.
20712	" 20..	" ..	0 30	Brand 'E'	" ..	West Coast, B.C., Fishing and Trading Co.
20713	" 20..	" ..	0 30	'Clover Leaf'	Larose & Co., Sussex St	Packed at Lulu Island, B.C.
20714	" 20..	" ..	0 20	'Ocean'	G. Marineau, 64 Murray St.	Malcolm & Windsor, Steveston, B.C.
20715	" 21..	" ..	0 24	'Red Clover'	J. Boyden & Son, Sussex St.	Anglo B. C. Packing Co., Vancouver.
20716	" 21..	" ..	0 25	'Triangle'	H. Cussans, 115 George St.	B. C. Canning Co., Victoria, B.C.
20717	" 21..	" ..	0 30	'Laurel Wreath'	Larose & Co., Sussex St	Anglo B. C. Canning Co., Vancouver.
20718	" 21..	" ..	0 25	Brand 'C'	Kennedy & Co., Wellington St.	Skeena Packing Co., B.C.
20719	" 21..	" ..	0 30	'Lynx'	Goodall Bros., Wellington St.	Anglo B. C. Packing Co.
20720	" 21..	" ..	0 25	'Corn Flower'	A. McKenzie, O'Connor St.	

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100 Samples of Canned Salmon—Continued.

RESULTS OF ANALYSIS.						Condition of Fish and Colour, &c.	No. of Sample.	Official Analyst's Remarks.
Metallic Contamination.				Preservatives.				
Copper.	Lead.	Tin.	Iron.	Borax.	Salicylic Acid.			
.....	Trace...	Present.	Present.	.....	None...	Taste, smell and colour good, sound and firm.	19943	Genuine.
.....	" ..	" ..	" ..	.....	" ..	" ..	19944	"
.....	" ..	" ..	" ..	.....	" ..	Taste and smell good, colour pale, sound and pretty firm.	19945	"
.....	" ..	" ..	" ..	.....	" ..	Taste, smell and colour good, sound and firm.	19946	"
.....	=0·0009 p. c.	" ..	" ..	.....	" ..	" ..	19947	Contaminated with lead.
.....	.....	" ..	" ..	.....	" ..	" ..	19948	Genuine.
.....	Trace ..	" ..	" ..	.....	" ..	" ..	19949	Doubtful.
.....	.....	" ..	" ..	.....	" ..	" ..	19950	Genuine.
.....	=0·0012 p. c.	" ..	" ..	.....	" ..	Taste and smell only fair, colour rather pale, pretty firm.	19951	Contaminated with lead.
None.	None.	None.	.....	None.	None.	Flesh firm, good colour, odour and taste; tin has a few dark spots.	20711	Good.
"	Doubt- ful trace.	"	.....	"	"	Flesh rather pale, but good odour and taste; tin clean.	20712	"
"	None.	"	.....	"	"	Colour, odour and taste very good; flesh firm; tin clean.	20713	"
"	"	Faint trace.	.....	"	"	Strong metallic odour when opened, flesh soft and dirty white, most likely been long in the tin, does not taste badly.	20714	Stale, but no bad.
"	"	"	.....	"	"	Flesh gray but firm and sweet; tin in good con- dition.	20715	Good.
"	"	None.	.....	"	"	Very fine in colour, odour and taste; tin very slight- ly spotted.	20716	Very good.
"	"	Faint trace.	"	"	Colour, odour and taste very good; tin has a few dark spots.	20717	Good.
"	"	None.	"	"	" ..	20718	"
"	"	"	"	"	" ..	20719	"
"	"	"	"	"	Colour, odour and taste very good; tin clean.	20720	"

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STATEMENT of the Results of Examining

No. of Sample.	Date of Collection.	Quantity Purchased.	Cost.	Name or Brand.	NAME AND ADDRESS OF	
					Vendor.	Packer as shown on Label.
	1900.		\$ cts.	<i>Official Analyst Dr. F. X. Valade, Ottawa</i>	<i>Granby, P.Q.</i>	
19932	June 21..	3 cans.	0 45	'Queen'.....	H. Paré.....	British American Packing Co.
19933	" 21..	" ..	0 45	'Queen Charlotte'..	Hade Bros.....	B. C. Canning Co
19934	" 21..	" ..	0 38	'Sunflower'.....	N. Mitchell.....	North Coast Packing Co.
19935	" 21..	" ..	0 54	'Red Clover'..	D. Hebert, Drummond-ville.	Anglo, B.C., Packing Co.
				<i>Official Analyst, Dr. W. H. Ellis, Toronto.</i>	<i>Toronto.</i>	
20721	" 30..	2 tins...	0 30	"Horseshoe'.....	T. Reed, 802 Yonge St.	Richmond Canning Co., Victoria, B.C.
20722	" 30..	" ..	0 25	'Globe'.....	" ..	Globe Canning Co., Claxton, B.C.
20723	" 30..	" ..	0 25	'Cariboo'.....	M. Moyer & Son, 100 Queen St. W.	Steveston Canning Co., B.C.
20724	" 30..	" ..	0 25	'Flagship'.....	J. A. Johnson, 775 Yonge St.	R. Ward & Co., Victoria, B.C.
					<i>Hull, P.Q.</i>	
20725	July 3..	" ..	0 24	'Faust'.....	J. Bertrand.....	Anglo B. C. Packing Co.
20726	" 3..	" ..	0 26	'Red Clover'..	Deschamps & Carriere.	" ..
					<i>Aylmer, P.Q.</i>	
20727	" 3..	" ..	0 25	'Queen Charlotte'...	S. Lochnan.....	B. C. Canning Co.....
20728	" 3..	" ..	0 30	'Empress'.....	C. Devlin.....	Lulu Island Packing Co., Vancouver.
					<i>St. Catharines, Ont.</i>	
20729	June 30..	" ..	0 25	'Viking'.....	Mrs. McLean.....	Clayoquot Fishing and Trading Co., Victoria.
20730	" 30..	" ..	0 25	.....	Moore & Pakman.	Lowe Inlet Packing Co., B.C.
20731	" 30..	" ..	0 25	'Viking'.....	" ..	Clayoquot Fishing and Trading Co., Victoria.
20732	" 30..	" ..	0 25	'Victory'.....	A. Wilson.....	McPherson & Hickey, B.C.
					<i>Montreal.</i>	
19928	" 19..	3 ..	0 30	'Nansen'.....	L. P. Forrest, 1978 St. Catherine St.	B. C. Packing Co., Vancouver.
19929	" 19..	" ..	0 35	'Drysdale'.....	S. Cardinal, 2307 Notre Dame St.	Canoe Pass Canning Co., B.C.
					<i>Farnham, P.Q.</i>	
19930	" 19..	" ..	0 30	'White Salmon'....	C. L. Elms, Main St.	B. C. Packing Co. New Westminster.
19931	" 19..	" ..	0 35	'S. & S'..	" ..	Imperial Canning Co. Victoria.

SESSIONAL PAPER No. 14

100 Samples of Canned Salmon—Continued.

RESULTS OF ANALYSIS.						Condition of Fish and Colour, &c.	No. of Sample.	Official Analyst's Remarks.
Metallic Contamination.				Preservatives.				
Copper.	Lead.	Tin.	Iron.	Borax.	Salicylic Acid.			
None.	None.	None.	. . . . .	None.	None.	In good condition, flesh firm ; tin slightly brown in patches.	19932	Good.
"	"	Faint trace.	. . . . .	"	"	Good in colour, odour and taste, flesh firm ; tin clean.	19933	"
"	Doubt- ful trace.	"	. . . . .	"	"	Flesh soft and gray, but odour and taste good ; tin clean.	19934	"
"	"	None.	. . . . .	"	"	Flesh firm, good colour odour and taste ; tin a little corroded.	19935	"
None.				None.		Red, firm, and in good con- dition.	20721	Unadulterated
"				"		" "	20722	"
"				"		" "	20723	"
Slight trace of metallic con- tamination.				"		" "	20724	"
None.				"		" "	20725	"
"				"		" "	20726	"
"				"		" "	20727	"
Slight trace of metallic con- tamination.				"		" "	20728	"
Trace of metallic contamination.				"		Red, soft, good condition.	20729	"
"				"		Red, firm, good condition.	20730	"
"				"		" "	20731	"
Slight trace of metallic con- tamination.				"		Light red, soft, good con- dition.	20732	"
None.				"		Yellowish white, firm, and in good condition.	19928	"
"				"		Red, firm, good condition.	19929	"
.	Traces.	Traces.	. . . . .	. . . . .	None.	Yellowish white, firm, and in good condition.	19930	"
. . . . .	"	"	. . . . .	. . . . .	"	Red, firm, good condition.	19931	"

1-2 EDWARD VII., A. 1902

STATEMENT of the Results of Examining

No. of Sample.	Date of Collection.	Quantity Purchased.	Cost.	Name or Brand.	NAME AND ADDRESS OF	
					Vendor.	Packer as shown on Label.
	1900.		\$ cts.	<i>Official Analyst, F. T. Harrison, London.</i>	<i>Clinton, Ont.</i>	
19361	June 19..	2 tins..	0 25	'Royal Club'.....	Harrison Wiltse	B C. Canning Co., Victoria
19362	" 19..	" ..	0 25	'O, Wee, Kay, No '.	F. Melville.....	" " ..
					<i>Goderich, Ont.</i>	
19363	" 19..	" ..	0 25	.....	T. G. Tipling.	Lowe Inlet Pkg. Co., B.C.
19364	" 19..	" ..	0 25	'Queen Charlotte'..	O. C. Whitely.....	B. C. Canning Co.....
					<i>Hensal, Ont.</i>	
19365	" 20..	" ..	0 25	'Golden Net'.....	E. Rannie.....	" "
19366	" 20..	" ..	0 25	'Viceroy '	"	" "
					<i>Exeter, Ont.</i>	
19367	" 20..	" ..	0 25	'Triangle'.....	Farmer Bros.....	Windsor Canning Co., B.C
19368	" 20..	" ..	0 30	'Clover Leaf'... ..	J. A. Sheward.....	Packed at Lulu Island, B. C.
					<i>London, Ont.</i>	
19369	" 21..	" ..	0 20	'Favorite'.....	Turville & Nicholas, 125 Dundas St.	Namu Cannery, B.C.....
19370	" 21..	" ..	0 20	'Southern Cross'....	Mrs. George, 58 Dundas St.	.....
					<i>St. Hyacinthe, P.Q.</i>	
19924	" 18 . 3	" ..	0 45	'Clover Leaf'.....	S. Bourgeois & Co....	Packed at Lulu Island, B. C.
19925	" 18..	" ..	0 30	L.C.F.C. in circle...	O. Brodeur.. ..	.....
19926	" 18..	" ..	0 36	'Lynx'.....	T. G. Bourgeois.....	Anglo British Pkg. Co., B. C.
					<i>Montreal.</i>	
19927	" 19..	" ..	0 36	'Excelsior'.....	L. P. Forrest, 1978 St. Catherine.	Excelsior Pkg. Co., Ladner's Landing, B.C.
				<i>Official Analyst, E. B. Kenrick, Winnipeg.</i>	<i>Winnipeg.</i>	
17245	" 20..	3 cans..	0 25	'Ocean'	Kenneth Mackenzie & Co.	Malcolm & Windsor, Steveston, B.C.
17246	" 20..	" ..	0 35	'Neptune'.....	" " ..	Skeena River Pkg. Co., Victoria, B.C.
17247	" 20..	" ..	0 40	'Capital'.....	" " ..	Victoria Canning Co.....
17248	" 20.	" ..	0 35	'Red Rose'.....	" " ..	R. Ward & Co., Victoria, B.C.
17249	" 20..	" ..	0 40	'Maple Leaf'.....	" " ..	Delta Canning Co., Victoria, B.C.
17250	" 20..	" ..	0 35	'Snow Shoe'.....	Codville & Co.....	R. Ward & Co., Victoria B.C.

SESSIONAL PAPER No. 14

100 Samples of Canned Salmon—Continued.

RESULTS OF ANALYSIS.						Condition of Fish and Colour, &c.	No. of Sample.	Official Analyst's Remarks.
Metallic Contamination.				Preservatives.				
Copper.	Lead.	Tin.	Iron.	Borax.	Salicylic Acid.			
.....	None.	None.	Trace.	None.	None.	Odour good, flesh good colour and firm ; can not corroded.	19361	Not adulterated.
.....	"	Trace.	"	"	"	Odour good, flesh rather light, firm and apparently in good condition ; can not corroded.	19362	"
.....	"	"	"	"	"	Odour good, flesh good colour and firm, not cor- roded.	19363	"
.....	"	"	"	"	"	Odour good, flesh rather light colour, fairly firm ; can not corroded.	19364	"
.....	"	None.	"	"	"	Odour good, colour normal, flesh firm ; can not cor- roded.	19365	"
.....	"	"	"	"	"	Odour good, flesh good colour and firm ; can not corroded.	19366	"
Acciden	tally lost	portion	reserved	"	"	Odour good, flesh very light coloured and rather soft, can not corroded.	19367	"
... ..	None.	Slight trace.	None.	"	"	Odour good, colour good, flesh firm ; can not cor- roded.	19368	"
.....	"	None.	"	"	"	Odour good, flesh rather light and not very firm.	19369	"
.....	"	Trace.	"	"	"	Odour good, flesh firm and good colour ; can not cor- roded.	19370	"
.....	"	"	Trace.	"	"	" " " "	19924	"
.....	"	None.	None.	"	"	" " " "	19925	"
.....	Very slight trace.	Trace.	Trace.	"	"	Odour good, flesh rather light, firm and apparently good ; can slightly dark- ened in spots.	19926	"
.....	None.	"	None.	"	"	Odour good, colour good, flesh fairly firm ; can not corroded.	19927	"
.....	.....	Traces.	.....	.....	.....	Colour very pale.....	17245	Genuine.
.....	.....	"	.....	.....	.....	Colour pale, bitter taste...	17246	"
.....	.....	"	.....	.....	.....	" " " "	17247	"
.....	.....	"	.....	.....	.....	Col ur pale, unpleasant odour.	17248	"
.....	.....	"	.....	.....	.....	Of good colour and generally good quality.	17249	"
.....	.....	"	.....	.....	.....	Contents of tin much broken up and pale in colour, otherwise in good condition.	17250	"

STATEMENT of the Results of Examining

No. of Sample.	Date of Collection.	Quantity Purchased.	Cost.	Name of Brand.	NAME AND ADDRESS OF	
					Vendor.	Packer as shown on Label.
	1900.		\$ cts.	<i>Official Analyst, E.B. Kenrick, Winnipeg.</i>	<i>Winnipeg.</i>	
17251	June 20..	3 cans..	0 35	.....	Cocville & Co	Lowe Inlet Pkg. Co., Victoria, B.C.
17252	" 20..	" ..	0 40	'Clover Leaf'.....	"	Packed at Lulu Island, B.C.
17253	" 20..	" ..	0 35	'Blue Jacket' . . .	"	The English Bay Canning Co., Vancouver, B.C.
17254	" 20..	" ..	0 30	'Buffalo'.....	"	Bon Accord Fishery Co., B.C.
17255	" 20..	" ..	0 35	.....	" .....	Imperial Pkg. Co., Vancouver, B.C.
17256	" 20..	" ..	0 40	'Eagle'.	John Morrin & Co....	Victoria Canning Co., B.C.
				<i>Official Analyst, Dr. C. J. Fagan, B.C.</i>	<i>Vancouver, B.C.</i>	
20196	" 20..	2 cans..	0 20	'Fraser River'.....	Welsh & Nightingale..	.....
20197	" 20..	" ..	0 25	'Princess'.. . . .	C. Uichida.....	C. G. Hobson & Co., Vancouver.
20198	" 20..	" ..	0 20	'Moss Rose'.....	J. Donald & Co... ..	Goodmurphy Dinsmore Pkg. Co., B.C.
20199	" 20..	" ..	0 20	'Fraser River'.....	E. Clayton.....	.....
20200	" 20..	" ..	0 20	'Imperial'.....	Edgett & Co	Dunsmuir Island Canning Co., B.C.
21501	" 20..	" ..	0 20	'Signal'	A. H. Keeping.. ..	Pacific Pkg. Co.....
21502	" 20..	" ..	0 20	'Trident'.....	F. Filion.....	.....
21503	" 21..	" ..	0 25	'Triangle'.....	W. H. Walsh.....	B. C. Canning Co... ..
21504	" 21..	" ..	0 25	'Viceroy'.....	McCracken & Beath...	" "
21505	" 21..	" ..	0 25	'Wurzburgs'..	Mrs. Fleming.....	Wurzburg & Co., Vancouver, B.C.
21506	" 21..	" ..	0 20	'Lily'.....	C. Mowat....	Anglo American Canning Co.
21507	" 21..	" ..	0 20	'Golden Net'.....	H. Harvey, New Westminster.	Columbia Pkg. Co.....

SESSIONAL PAPER No. 14

100 Samples of Canned Salmon—*Concluded.*

RESULTS OF ANALYSIS.						Condition of Fish and Colour, &c.	No. of Sample.	Official Analyst's Remarks.
Metallic Contamination.				Preservatives.				
Copper.	Lead.	Tin.	Iron.	Borax.	Salicylic Acid.			
.....	Traces..	.....	.....	.....	Good colour and quality...	17251	Genuine.
.....	"	" " ...	17252	"
.....	"	Contents of can in finely divided state and of a pale colour.	17253	"
.....	"	Contents of tin rather broken up and of light colour.	17254	"
.....	"	Of good colour and quality.	17255	"
.....	"	Pale in colour and much broken up.	17256	"
None.				.....	.....	Red salmon, sweet smell, in good condition.	20196	
Tin present				.....	.....	" " ....	20197	
None.				.....	.....	" " ....	20198	
"				.....	.....	White salmon, no odour but not very fresh.	20199	
"				.....	.....	Red salmon, sweet and fresh.	20200	
"				.....	.....	Red salmon, stale.....	21501	
"				.....	.....	Red salmon, odour very bad, old fish, soft and broken down.	21502	
"				.....	.....	Red salmon, in fair condi- tion, odour slightly stale.	21503	
"				.....	.....	Red salmon, sweet, firm and in good condition.	21504	
"				.....	.....	White salmon trout, con- dition fair.	21505	
"				.....	.....	Red salmon, sweet, fresh and in good condition.	21506	
"				.....	.....	Red salmon, in good con- dition.	21507	

APPENDIX O.

BULLETIN No. 77.—EFFERVESCENT SODIUM PHOSPHATE.

OTTAWA, June 15, 1901.

W. J. GERALD, Esq.,
Deputy Minister of Inland Revenue.

SIR,—In December last, in consequence of a recommendation from Mr. A. McGill, B.A., my assistant, a collection was made of samples of Effervescent Sodium Phosphate a medicinal preparation described in the British Pharmacopœia. Sixty-four samples were in all collected and submitted to the district analysts for examination. Their results and opinions, as well as the names of the vendors, are given in the subjoined Table No. I. It will be observed that, in this table, the column which in previous reports has been headed: 'Name and address of manufacturer or furnisher as given by vendor,' has been altered and reads in the table referred to: 'Name and address of manufacturer as shown by label.' This change has been made in consequence of a decision by your predecessor, to whom complaints had been made that, occasionally, some injustice had been suffered by wholesale merchants in consequence of incorrect information supplied by the parties who sold the samples.

Out of the 64 samples analysed only 13, or 20 per cent, have been found to be genuine by the district analysts. The greater number of the adulterated samples have been so characterized, because they do not correspond with the requirements of the British Pharmacopœia.

I subjoin herewith Mr. McGill's report along with Table II. appended to it, and have to recommend the publication of the whole report now submitted.

I have the honour to be, sir,

Your obedient servant,

THOMAS MACFARLANE,
Chief Analyst.

TABLE

RESULTS of the Examination of 64 Samples

Date of Collection.	No. of Sample.	Quantity purchased.	Cost.	NAME AND ADDRESS OF	
				Vendor.	Manufacturer, as shown by Label on Bottles.
1900.			\$ cts.	<i>Official Analyst, M. Bowman, Halifax, N.S. Kentville, N.S.</i>	
Dec. 26	20021	12 oz...	1 25	R. S. Masters .....	.....
				<i>Truro, N.S.</i>	
" 28	20022	12 " ...	1 50	Crowe Bros.....	Parke, Davis & Co., Walkerville, Ont..
				<i>Halifax, N.S.</i>	
" 29	20023	12 " ...	1 50	G. F. Colwell.....	.....
" 29	20024	12 " ...	1 25	Buckley Bros.....	.....
" 29	20025	12 " ...	1 50	G. A. Burbridge..	J. Wyeth Bros., Philadelphia, U.S.A.
				<i>St. John, N.B.</i>	
" 19	17756	3 bots .	0 75	The Canadian Drug Co., Ltd., 60 Prince William St.	The Toronto Drug Company
" 20	17757	3 " ...	1 50	Silas McDiarmid, King St.....	J. Wyeth Bros.. Philadelphia.....
" 20	17758	12 oz...	1 20	Geo. A. Moore, 109 Brussel St..	.....
" 20	17759	3 bots .	0 75	Hazen J. Dick, 144 Charlotte St.	Chandler & Massey, Toronto and Montreal.
" 21	17760	12 oz...	0 75	The Canadian Drug Co., Ltd...	.....
				<i>Official Analyst, Dr. M. Fiset, Quebec. Quebec.</i>	
" 19	19763	2 bots .	1 00	Laroche & Co., Fabrique St.....	H. K. Wampole & Co., Philadelphia...
" 19	19764	2 " ...	1 00	W. Brunet & Co., 139 St. Joseph St.	Wyeth Bros., Philadelphia
" 19	19765	2 " ...	0 50	V. Giroux, St. Peter St.....	Lyman, Sons & Co., Montreal
" 20	19766	2 " ...	0 78	J. E. Livernois, Fabrique St....	Wyeth Bros., Philadelphia
" 20	19767	2 " ...	0 70	J. E. Dubé, St. John St.....	Lyman, Sons & Co., Montreal
				<i>St. Hyacinthe.</i>	
" 27	19768	2 " ...	1 00	Eugene St. Jacques, Cascade St..	H. K. Mulford & Co., Philadelphia and Chicago.
				<i>Sherbrooke, P.Q.</i>	
" 28	19769	1 bot...	0 50	E. C. Fraser, Commercial St.....	H. K. Wampole & Co., Philadelphia...
" 28	19770	1 " ...	0 50	" "	H. K. Mulford & Co., Philadelphia and Chicago.
" 28	19771	1 " ...	1 00	W. H. Griffith, 121 Wellington St.	Wyeth Bros., Philadelphia
" 29	19772	$\frac{3}{4}$ lb ...	1 00	J. C. Sutherland, Main St.....	.....
Sept. 7	19967	2 bots .	0 50	W. H. Griffith, 121 Wellington St.	.....

SESSIONAL PAPER No. 14

I.

of Effervescent Sodium Phosphate.

RESULTS OF ANALYSIS.						No. of Sample.	Remarks by Official Analyst.
Phosphoric Acid (P ₂ O ₅).	Organic Acids, as Tartaric.	Citric Acid.	Soda Bicarb.		Sugar.		
p. c.	p. c.	p. c.	Originally present.	Undecom- posed.	p. c.		
5·27	50·25	.....	39·21	.....	....	20021	Below standard in sodium phosphate.
8·02	48·57	.....	35·39	...	.....	20022	" "
7·85	42·37	.....	41·93	.....	.....	20023	" "
5·63	51·15	...	37·59	.....	.....	20024	" "
5·63	49·68	.....	39·06	.....	.....	20025	" "
4·12	45·37	.....	46·39	.....	....	17756	" "
5·36	52·29	.....	36·99	..	.....	17757	" "
8·32	42·56	.....	40·80	.....	.....	17758	" "
5·92	44·44	.....	43·72	.....	.....	17759	" "
4·97	43·31	....	46·75	..	.....	17760	" "
8·69	45·00	Present.	50·32	33·02	....	19763	Genuine.
6·01	49·87	"	49·68	33·08	.....	19764	Somewhat low in sodium phosphate, otherwise good.
1·53	35·06	"	35·53	24·43	.....	19765	Much below the B. P. standard.
6·14	50·25	"	50·48	34·93	..	19766	Rather low in sodium phosphate, otherwise good.
3·00	35·25	"	35·70	20·52	.....	19767	Much below the B. P. standard.
15·85	30·44	"	29·94	23·29	.....	19768	Very high in sodium phosphate.
9·02	47·10	"	51·91	25·39	.....	19769	Genuine.
15·70	36·38	"	28·90	21·67	.....	19770	Very high in sodium phosphate.
6·14	50·02	"	50·10	35·03	.....	19771	Rather low in sodium phosphate, otherwise good.
4·16	46·35	"	47·40	29·40	.....	19772	Below B. P. standard in sodium phosphate.
2·81	53·55	.....	36·63	..	....	19967	Adulterated, being greatly below the B. P. standard sodium phosphate.

TABLE

RESULTS of the Examination of 64 Samples of

Date of Collection.	Number of Sample.	Quantity purchased.	Cost.	NAME AND ADDRESS OF	
				Vendor.	Manufacturer, as shown by Label on Bottle.
1900.			¢ cts.	<i>Official Analyst, Dr. F. X. Valade, Ottawa.</i>	
				<i>Montreal.</i>	
Dec. 14	19753	6 oz....	0 50	H. Lebeau, 466 St. James St....	
" 14	19754	"	0 50	John T. Lyons, 2 Bleury	
" 14	19755	2 bots..	0 50	L. A. Bernard, 1882 St Catherine St.	Lyman, Sons & Co., Montreal.....
" 17	19756	6 oz....	0 60	J. H. Charron, 1978 Notre Dame St.	
" 18	19757	2 bots..	0 75	Leeming, Miles & Co., St Sul-pice St.	Alfred Bishop Co., London, England ..
" 18	19758	1 bot..	1 00	Kerry Watson & Co., St. Paul St.	
" 18	19759	5 oz....	0 50	T. E. Huot, St. Catherines St....	
" 18	19760	2 bots..	0 75	Parke, Davis & Co., St. Paul St.	Vendors ..
" 18	19761	" ..	0 83	Davis, Lawrence & Co., St. An-toine St.	Wyeth Bros., Philadelphia.....
"	19762	" ..	0 70	Evans & Sons, St. Jean Baptiste.	
				<i>Ottawa.</i>	
Sept. 1	20762	8 oz....	0 50	G. Kennedy, Druggist.....	
				<i>Toronto.</i>	
Dec. 21	20801	8 oz....	0 75	F. W. McLean, 121 Church St...	'Whites,' Queen City Drug Co., Agents.
" 21	20802	"	0 25	J. F. Taylor, 144 Queen E.....	Lyman Bros. & Co., Toronto.....
" 21	20803	"	0 60	R. Robinson, 216 Queen E.....	
" 21	20804	"	0 35	G. A. Bingham, 100 Yonge St...	H. K. Wampole & Co., Philadelphia...
" 21	20805	"	0 30	G. C. Harbottle, 135 King W...	
" 21	20806	"	0 50	Burgess, Powell & Co., Yonge St.	Wyeth Bros., Philadelphia.....
				<i>Pcterborough.</i>	
" 22	20807	"	1 00	Ormond & Walsh, Druggist.....	H. K. Mulford & Co., Philadelphia ...
" 22	20808	"	1 00	W. Madill, Druggist.....	Wyeth Bros., Philadelphia
" 22	20809	16 oz....	0 80	H. H. Edmison, Druggist.....	
" 22	20810	10 oz....	0 50	J. Nugent, Druggist	
Sept. 6	20777	12 oz....	1 00	J. D. Tully, Druggist.....	Wyeth Bros., Philadelphia. ...
				<i>Official Analyst, F. T. Harrison, London, Ont.</i>	
				<i>Stratford, Ont.</i>	
Dec. 18	19424	12 oz...	1 00	E. C. Nasmyth	Parke, Davis & Co
" 18	19425	12 " ...	1 00	H. W. Thomson	W. H. Allen, Windsor, Ont.
				<i>London, Ont.</i>	
" 18	19426	12 " ...	1 00	Cairncross & Lawrence, 216 Dun-das St.	
" 18	19427	12 " ...	0 80	C. McCallum & Co., cor. Rich-mond St.	

SESSIONAL PAPER No. 14

—Continued.

Effervescent Sodium Phosphate—Continued.

RESULTS OF ANALYSIS.						Number of Sample.	Remarks by Official Analyst.
Phosphoric Acid (P ₂ O ₅ .)	Organic Acids, as Tartaric.	Citric Acid.	Soda Bicarb.		Sugar.		
			Originally present.	Undecom- posed.			
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	
4·80	43·86	Present.	49·13	.....		19753	Below standard in phosphates and carelessly com- pounded.
5·65	43·48	"	48·70	.....		19754	Not up to standard in phosphates and carelessly com- pounded.
1·50	42·82	"	47·96	.....		19755	Adulterated, being much too low in phosphates.
4·50	38·24	"	42·83	.....		19756	Adulterated, being low in phosphates.
4·37	40·86	"	45·77	.....		19757	Below standard, being low in phosphates. Sample care- lessly compounded.
7·20	40·49	"	45·38	.....		19758	Genuine.
2·50	36·37	"	40·73	.....		19759	Adulterated. Much too low in phosphates.
9·20	41·79	"	48·71	.....		19760	Good.
5·65	38·99	"	43·67	.....		19761	Below standard. Sample carelessly compounded.
9·30	40·31	"	45·15	.....		19762	Genuine, but carelessly compounded.
3·98	28·31	12·97	45·35	.....		20762	Good
4·86	38·85	Present.	.....	27·29	.....	20801	Adulterated.
2·83	35·35	"	.....	22·13	.....	20802	"
9·73	50·80	"	.....	30·53	.....	20803	Unadulterated.
9·38	51·76	"	.....	27·56	.....	20804	"
5·17	52·36	"	.....	34·07	.....	20805	Adulterated.
6·10	57·25	"	.....	33·78	.....	20806	"
17·66	12·49	"	.....	24·33	.....	20807	Contains an excess of phosphoric acid, therefore adul- terated.
6·45	24·24	"	.....	35·69	.....	20808	Adulterated.
8·15	55·53	"	.....	15·93	.....	20809	"
5·07	46·26	"	.....	32·73	.....	20810	"
6·14	48·65	"	.....	36·85	.....	20777	Not genuine.
9·72	47·96	Present.	50·97	.....		19424	Genuine.
36·36	None	None ..	40·20	.....		19425	Adulterated, not being made according to the B. P.
10·36	46·07	Present.	49·20	.....		19426	Genuine.
5·12	42·10	" ..	44·60	.....		19427	Adulterated.

TABLE

RESULTS of the Examination of 64 Samples

Date of Collection.	No. of Sample.	Quantity purchased.	Cost.	NAME AND ADDRESS OF	
				Vendor.	Manufacturer as shown by Label on Bottles.
1900.			\$ cts.	<i>Windsor, Ont.</i>	
Dec. 19	19429	12 " ...	0 60	A. Wilkinson.....	Toronto Drug Co.
				<i>London, Ont.</i>	
" 20	19430	12 " ...	0 60	C. Symmonds, 468 Dundas St.....	
" 20	19431	12 " ...	0 40	W. E. Saunders	
" 20	19432	12 " ...	0 60	N. J. McDermid, Dundas St	
" 20	19433	12 " ...	0 60	J. Callard, Richmond St	
Sept. 7	19389	2 bots	0 40	C. McCallum, druggist	
				<i>Official Analyst, E. B. Kenrick, Winnipeg.</i>	
				<i>Ottawa.</i>	
Dec. 10	20793	8 oz. ...	0 50	J. J. Allen, Bank St	Toronto Drug Co ..
" 10	20794	10 " ...	0 35	G. Watson, Bank St	
" 10	20795	4 " ...	0 50	Kirby Bros.....	
" 10	20796	8 " ...	0 40	J. J. Allen, Bank St.....	
" 10	20797	6 " ...	0 45	S. J. Stevenson, Elgin St.....	
" 10	20798	8 " ...	0 75	A. E. Brethour, Bank St.....	
" 10	20799	8 " ...	0 40	Skinner & Co., Wellington St.....	
" 10	20800	5 " ...	0 50	J. J. Allen, Bank St.....	Wyeth Bros., Philadelphia
				<i>Winnipeg.</i>	
Oct. 1	17271	1 bot..	1 00	W. J. Mitchell.....	
				<i>Official Analyst, Dr. C. J. Fagan, Victoria, B.C.</i>	
				<i>Vancouver, B.C.</i>	
" 20	21524	1 lb ...	0 75	J. K. Seymour.....	
1901.				<i>Victoria, B.C.</i>	
Jan. 22	21545	3 bots	1 50	Davis Bros.....	

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I—Continued.

of Effervescent Sodium Phosphate—Concluded.

RESULTS OF ANALYSIS.						No. of Sample.	Remarks by Official Analyst.
Phosphoric Acid (P ₂ O ₅).	Organic Acid, as Tartaric.	Citric Acid.	Soda Bicarb.		Sugar.		
p. c.	p. c.	p. c.	Originally present.	Udecom- posed.	p. c.		
5.25	41.65	" ..	43.20	.....	.....	19429	Adulterated.
9.34	41.40	" ..	48.60	.....	.....	19430	Genuine.
5.50	41.58	" ..	43.20	.....	.....	19431	Adulterated.
6.14	45.13	" ..	48.3	.....	.....	19432	"
4.22	42.61	" ..	44.80	.....	.....	19433	"
3.56	44.50	" ..	.....	.....	12.14	19389	Not made according to B. P. and is therefore adulterated.
4.17	35.72	9.89	47.03	.....	7.42	20793	Not in accordance with formula of B. P.
3.13	38.87	10.58	50.14	.....	7.29	20794	" "
10.05	27.40	18.88	50.54	.....	.....	20795	Genuine.
.....	18.71	13.08	37.14	.....	11.69	20796	Adulterated. Contains magnesium sulphate in the place of sodium phosphate.
10.71	24.60	16.54	42.85	.....	.....	20797	Genuine.
9.41	23.32	20.12	44.40	.....	.....	20798	"
2.22	19.52	14.64	35.43	.....	29.41	20799	Adulterated.
4.83	14.69	33.30	49.97	.....	.....	20800	Not in accordance with the formula of the B. P.
9.67	41.64	.....	30.01	.....	.....	17271	Has lost about 36 per cent of its carbon dioxide through keeping.
25.94	None.	21524	A phosphate of soda.
5.56	32.25	Present.	28.56	21545	Effervescing phosphate of soda.

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LABORATORY OF THE INLAND REVENUE DEPARTMENT,
OTTAWA, June 1, 1901.

THOS. MACFARLANE, Esq., F.R.S.C.,
Chief Analyst.

SIR,—On November 16 last, I submitted to you a preliminary report upon a few samples of Effervescing Phosphate of Soda, and two somewhat similar, but proprietary, articles, viz. : Abbey's Effervescent Salt and Eno's Fruit Salt. On account of the large differences found between *Sodii Phosphas Effervescens* as occurring on the market, and as defined by the British Pharmacopœia, I recommended that a considerable number of samples should be subjected to examination, and I have now the honour to furnish herewith a report upon the whole number (64) analysed.

I have the honour to be, sir,
Your obedient servant,

A. MCGILL.

Sodii Phosphas Effervescens, or Effervescent Phosphate of Soda.

The British Pharmacopœia prescribes the following formula and mode of preparation for this article :—

Sodium phosphate, crystals.....	50 parts.
“ bicarbonate (powder).....	50 “
Tartaric acid.....	27 “
Citric acid.....	18 “

	145 “

The crystals of sodium phosphate are directed to be dried to loss of 60 per cent of their weight. Since this salt contains 60·3 per cent of water of crystallization, this means the practical dehydration of it. The bicarbonate of soda and the tartaric acid are normally anhydrous. The citric acid contains one molecule of water, = 8·7 per cent of its weight. Calculated to dry materials the quantities named above become as follows :—

50 parts cryst. sod. phos. =	20 pts. anhydrous.
50 “ bicarb. soda =	50 “ “
27 “ tartaric acid =	27 “ “
18 “ citric acid =	16·4 “ “
---	---
145 “	113·4 “ “

After mixing the ingredients, the mixture is directed to be further dried so as to weigh about 100 parts. Assuming this further loss to consist solely of carbonic acid gas, resulting from the conversion of bicarbonate of soda into mono-carbonate, the final product should consist of :—

Anhydrous sodium phosphate.....	20 per cent.
Bicarbonate of soda..	16 “
Mono-carbonate of soda.....	22 “
Tartaric acid.....	27 “
Anhydrous citric acid	16 “

	100

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Corresponding to :—

	P. C. organic acids.	Na ₂ O	P ₂ O ₅	CO ₂	H ₂ O	
HNa ₂ PO ₄	20	= 8·73	+ 10·00	..	+ 1·27	
HNa CO ₃	15	= 5·54	.....	+ 7·90	+ 1·56
Na ₂ CO ₃	22	= 12·87	.....	+ 9·13	+
H ₂ C ₄ H ₄ O ₆	27 }	43	.....	....	....
C ₃ H ₄ OH (CO ₂ H) ₃	16 }					
	<hr/> 100	<hr/> 43	<hr/> 27·14	<hr/> 10·00	<hr/> 17·03	<hr/> 2·83

Analysis should therefore give :	
Total organic acids (as tartaric acid).....	43·0 per cent.
Phosphoric acid (as P ₂ O ₅).....	10·0 "
Soda (as Na ₂ O)	27·14 "
Carbonic acid gas (CO ₂).....	17·03 "
Water (H ₂ O).....	2·83 "
	100·00 "

It is not, however, conceivable that the process of drying the mixture brings about no further chemical changes than are here supposed. On the contrary, it is probable that loss of carbonic acid is, to some extent, brought about by interaction between the organic acids and the bicarbonate of soda, thus forming sodium citrate and tartrate. It is further certain that more or less alteration in composition must result from the separation of the product by sieves into granules of ‘uniform and convenient size,’ as directed by the pharmacopœia. Besides this, it is inevitable that a gradual reaction should go on between the free acids and the carbonate of soda, during the time that the article is kept in stock. Most of the samples found on the market are very carefully put up by the manufacturers, in order to prevent, as much as possible, deterioration of the kind just referred to ; but absolute prevention of it is probably impossible.

This preparation is evidently intended as a pleasant means of administering sodium phosphate, and it occurs for the first time in the British Pharmacopœia of 1898. It is not mentioned in the United States Pharmacopœia of 1890. The most important component of the effervescent phosphate is therefore the contained phosphate of soda. In proportion as weight is lost through interaction of free organic acid with bicarbonate of soda, the percentage weight of phosphate of soda will increase. As I have already shown, a freshly prepared sample of *sodii phosphas effervescens* should contain 10 per cent of its weight of P₂ O₅. On keeping such a sample sufficiently long for the whole of the bicarbonate to have reacted with the organic acids (which are in slight excess of the weight required to decompose the whole of the bicarbonate :—

$$\begin{array}{l} \text{H}_2 \text{C}_4 \text{H}_4 \text{O}_6 : 2 \text{HNa CO}_3 :: 150 : 168 = 27 : 30\cdot2 \\ \text{H}_3 \text{C}_6 \text{H}_5 \text{O}_7 : 3 \text{HNa CO}_3 :: 192 : 252 = 16 : 21\cdot0 \\ \hline = 43 : 51\cdot2 \end{array}$$

the article will have lost 17 per cent of its original weight, and the phosphoric acid will now constitute more than 12 per cent, by weight of it. Hence it is reasonable to demand that commercial samples of effervescent phosphate of soda shall contain phosphoric acid corresponding approximately to at least 10 per cent of P₂ O₅. Of the 64 samples analysed, three—viz. : 19,425, 20,796 and 21,524 are not effervescent phosphate. The remaining 61 show the following results, so far as phosphoric acid is concerned :—

Less than 2 per cent P ₂ O ₅	2 samples
" 3	4 "
" 4	4 "
" 5	10 "
" 6	13 "
" 7	7 "
" 8	2 "
" 9	4 "
" 10	9 "
" 11	3 "
" 18	3 "

Three samples contain a decided excess of phosphoric acid, viz. :—19,768, 19,770 and 20,807. These are made by an American firm.

Alkaline citrates and tartrates are possessed of purgative properties, and it is not impossible that the citrate and tartrate of soda present in excess, in most of the above samples which show a deficiency of phosphate, may efficiently replace the latter, so far as medicinal properties are concerned. Indeed the dose of Sodii Citro-tartras Effervescens (B.P.) is identical with that prescribed for Sodii Phosphas Effervescens. This preparation contains about 15 per cent of sugar, and the presence of sugar in certain of the samples collected as phosphate of soda, and containing low percentages of phosphate, would seem to imply a confusion of the two preparations. But it should be evident to manufacturers and dealers that the two substances referred to, are quite distinct, and that the purchaser of Sodium phosphate is entitled to receive the article, he asks for, and not a substitute for it. If such samples as 20,793, 20,794 and others, containing sugar, be sold as phosphate of soda, they are adulterated, within the meaning of the Act; while if sold as Effervescent Sodium Citro-tartrate, they are adulterated, as containing phosphate of soda. It is not, however, to be understood that any blame attaches to those manufacturers who have, up to this time, placed on the market an article of effervescing phosphate of soda, containing less (or more) than 10 per cent of P_2O_5 . As has already been mentioned, the preparation appears for the first time in the 1898 edition of the British pharmacopœia, and is not contained at all in the United States pharmacopœia. Manufacturing druggists were much in advance of the pharmacopœias and in manufacturing from private formulas they naturally uttered an effervescing phosphate of variable character. Many of the samples, whose analysis is here given, were doubtless in the hands of dealers before the preparation became officinal in 1898. Now, however, that effervescing phosphate of soda has been authoritatively defined it will be required of those who furnish it under its specific name that they should supply the British pharmacopœia article.

In sample 21,524, phosphate of soda has been supplied instead of the effervescent phosphate. Sample 20,796 is made up with Magnesium sulphate, and is consequently adulterated within the meaning of the Act. No. 19,425 contains no citric nor tartaric acid, and consists of acid phosphate with carbonate of soda. Of course this also constitutes adulteration.

In analysis, the estimation of phosphoric acid is effected by any of the recognized methods, and presents no difficulties. The organic acids present are conveniently estimated together by permitting complete reaction to take place, in solution, between the free acids present and the bi-carbonate of soda—with addition of a standard soda solution to exact neutralization. Of course, if the soda is already present in excess, sulphuric acid must be added in excess, carbonic acid boiled off, and the resulting solution carefully neutralized. On evaporating to dryness and charring, the organic acids furnish an equivalent amount of carbonates, from which they may be calculated as tartaric acid without much error. It is necessary to make at least a qualitative test for citric acid, since this has a higher market value than tartaric, and in cases where judged desirable it may be well to estimate the tartaric acid directly as acid potassium salt.

The carbonate of soda existing as such may be estimated by determining the carbonic acid gas liberated by solution in water—with addition of acid, if necessary. This estimation gives an idea of the extent to which deterioration of the article by keeping has taken place.

The original bi-carbonate of soda present is calculated from the same data which furnish the total organic acids. Of course, where considerable deterioration has taken place, the expressing of *original* bi-carbonate of soda, as a percentage on the sample purchased, will give a number much in excess of the fact, and will cause the sum of phosphate soda, organic acids and (original) bi-carbonate soda to add to more than 100. The maximum error that may result from this mode of expressing results may be about 15 to 20 per cent. In the accompanying table II., this is the interpretation to be put upon the numbers larger than 100 in the column headed 'Sum.' Where the number contained in this column is considerably less than 100, it is probably because sugar, or other component, has not been estimated. Where the number is exactly 100, it means

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that one of the components has not been directly estimated, but expressed by difference. It is probable that the bi-carbonate of soda is so expressed ; and, in this case, the number given would stand for residual bi-carbonate of soda, and will include sugar, etc., if present. It will be seen that Mr. Bowman has returned his analytical results in this way.

TABLE II.—EFFERVESCING PHOSPHATE OF SODA.

Serial Number.	Depart- mental Number.	Phosphoric Acid. (P ² O ⁵ .)	Organic Acids (as Tartaric.)	Bi-carbonate Soda. (HNa CO ³ .)	Phos. Soda, Calculated. (HNa ² PO ⁴ .)	Sum.	Sugar.	Remarks.	Analyst.
1	17756	4.12	45.37	46.39	8.24	100.00	.....	Bi-carbonate soda by difference.....	Bowman.
2	17757	5.36	52.29	36.99	10.72	100.00	.....	"	"
3	17758	8.32	42.56	40.80	16.64	100.00	.....	"	"
4	17759	5.92	44.44	43.72	11.84	100.00	.....	"	"
5	17760	4.97	43.31	46.75	9.91	100.00	.....	"	"
6	19424	9.72	47.96	50.97	19.44	118.37	.....	.....	Harrison.
7	19425	36.36	.....	40.20	.....	.....	.....	.....	"
8	19426	10.36	46.07	49.20	20.72	115.99	.....	.....	"
9	19427	5.12	42.10	44.60	10.24	98.94	.....	.....	"
10	19428	.....	.....	.....	.....	.....	.....	.....	"
11	19429	5.25	41.65	43.20	10.50	95.35	.....	.....	"
12	19430	9.34	44.40	48.60	18.68	111.68	.....	.....	"
13	19431	5.50	41.58	43.20	11.00	96.78	.....	.....	"
14	19432	6.14	45.13	48.30	12.28	107.71	.....	.....	"
15	19433	4.22	42.61	44.80	8.44	95.85	.....	.....	"
16	19753	4.80	43.86	49.13	9.60	102.59	.....	.....	Valade.
17	19754	5.65	43.48	48.70	11.30	103.48	.....	.....	"
18	19755	1.50	42.82	47.96	3.00	93.78	.....	.....	"
19	19756	4.50	38.24	42.83	9.00	90.07	.....	.....	"
20	19757	4.37	40.86	45.77	8.74	95.37	.....	.....	"
21	19758	7.20	40.49	45.38	14.40	100.27	.....	.....	"
22	19759	2.50	36.37	40.73	5.00	82.10	.....	.....	"
23	19760	9.20	41.79	48.71	18.40	108.90	.....	.....	"
24	19761	5.65	38.99	43.67	11.30	93.96	.....	.....	"
25	19762	9.30	40.31	45.15	18.60	104.06	.....	.....	"
26	19763	8.69	45.00	50.32	17.38	112.70	.....	.....	Piset.
27	19764	6.01	49.87	49.68	12.02	110.57	.....	.....	"
28	19765	1.53	35.06	35.53	3.06	73.65	.....	.....	"
29	19766	6.14	50.25	50.48	12.28	113.01	.....	.....	"
30	19767	3.00	35.25	35.70	6.00	76.95	.....	.....	"
31	19768	15.85	30.44	29.94	31.70	92.08	.....	.....	"
32	19769	9.02	47.10	51.91	18.04	117.05	.....	.....	"
33	19770	15.70	36.38	28.90	31.40	96.68	.....	.....	"
34	19771	6.14	50.02	50.10	12.28	112.40	.....	.....	"
35	19772	4.16	46.35	47.40	8.32	102.07	.....	.....	"
36	20021	5.27	50.25	39.21	10.54	100.00	.....	Bi-carbonate soda by difference.....	Bowman.
37	20022	8.02	48.57	35.39	16.04	100.00	.....	"	"
38	20023	7.85	42.37	41.93	15.70	100.00	"	"
39	20024	5.63	51.15	37.59	11.26	100.00	"	"
40	20025	5.63	49.68	39.06	11.26	100.00	"	"

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41	20793	4.17	35.72	47.03	8.34	108.40	7.42	Citric Acid = 9.89	Kenri
42	20794	3.13	38.87	50.14	6.26	113.14	7.29	" = 10.58	"
43	20795	10.05	27.40	50.54	20.10	116.92	.....	" = 18.88	.....	"
44	20796	.....	18.71	37.14	.....	.....	11.69	" = 13.03 contains magnesium sulphate	.....	"
45	20797	10.71	24.60	42.85	21.42	105.41	.....	instead of phosphate.	.....	"
46	20798	9.41	23.32	44.40	18.82	106.66	.....	Citric Acid = 16.54	.....	"
47	20799	2.22	19.52	35.43	4.44	103.44	29.41	" = 20.12	.....	"
48	20800	4.83	14.69	49.97	9.66	107.62	.....	" = 14.64	.....	"
49	20801	4.86	38.85	27.29	9.72	75.86	.....	" = 33.30	.....	Ellis.
50	20802	2.83	35.35	22.13	5.66	63.14	.....	.....	.....	"
51	20803	9.73	50.80	30.53	19.46	100.79	.....	.....	.....	"
52	20804	9.38	51.76	27.56	18.76	98.08	.....	.....	.....	"
53	20805	5.17	52.36	34.07	10.34	96.77	.....	.....	.....	"
54	20806	6.10	57.25	33.78	12.20	103.23	.....	.....	.....	"
55	20807	17.06	12.49	24.33	34.12	70.94	.....	.....	.....	"
56	20808	6.45	24.24	35.69	12.90	72.83	.....	.....	.....	"
57	20809	8.15	55.53	15.93	16.30	87.76	.....	.....	.....	"
58	20810	5.07	46.26	32.73	10.14	89.13	.....	.....	.....	"
59	21524	25.94	None.	.....	51.88	.....	.....	.....	.....	Fagan.
60	21545	5.56	32.25	28.56	11.12	71.93	.....	.....	.....	"
61	17271	9.67	41.64	30.01	.....	.....	.....	.....	.....	Kenrick.
62	20762	3.98	41.28	44.35	.....	.....	12.14	.....	.....	Valade.
63	19389	3.56	44.50	Harrison.
64	20777	6.14	48.65	36.85	12.29	97.79	Ellis.
65	19967	2.81	53.55	36.63	Fiset.

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Appendix.—At the same time that the first collection of Effervescent Phosphate of Soda was made, a few samples of two much advertised preparations, believed to have somewhat similar aperient properties, were obtained and analysed, I referto Eno's Fruit Salt and Abbey's Effervescent Salt.

Eno's Fruit Salt (No. 20,778).—This sample was analysed by Dr. Ellis, in October, 1900.

The following are his results :—

Sodium Bi-carbonate	50·01 Per cent.
Citric acid	47·11 “

Abbey's Effervescent Salt No.17,272 (Kenrick), No. 19,388 (Harrison).

Sulphuric acid (SO ₃)..	.....	1·60
Magnesia MgO	} 0·86	0·83
Calculated to Epsom Salts.....	f 5·29	5·10
Potash (K ₂ O).....	1·61	2·25
Soda Na ₂ O.	} 13·58	19·83
Calculated to bi-carb.....	f 36·80	53·70
Carbon dioxide.....	18·67	.....
Chlorine in Chlorides	0·07	.....
Cane sugar ..	12·34	15·38
Tartaric acid	40·45	39·75
Reducing Sugar.....	1·73	

The important feature of each preparation is the development, by solution, of an alkaline citrate or tartrate, and they resemble in many respects the Sodii Citro-Tartras effervescens of the British Pharmacopœia.

A. McG.

APPENDIX P.

BULLETIN No. 78.—WHITE LEAD IN OIL.

OTTAWA, Aug. 22, 1901.

W. J. GERALD, Esq.,
Deputy Minister of Inland Revenue.

SIR,—In accordance with the instructions of your predecessor, a collection of samples of white lead in oil, was made in the months of February and March last. 99 samples were collected in all, and submitted to the district analysts for examination. The results are shown in the subjoined table, and the following is a general view of the origin and character of the samples :—

No. of Samples.	Where Collected.	Sold as Pure But Adulterated.	Adulterated.	Genuine or Unadulterated.
8	Halifax, N.S.....	4	2	2
4	St. John, N.B... ..	0	1	3
4	Fredericton, N.B.....	1	0	3
5	Montreal, P.Q.....	3	1	1
2	St. Hyacinthe.....	0	0	2
3	St. Johns.....	1	0	2
2	Three Rivers.....	0	0	2
4	Quebec	4	0	0
6	Ottawa, Ont.	2	2	2
4	Brockville.....	0	2	2
4	Kingston	0	1	3
1	Stratford	0	0	1
2	Listowel.	1	0	1
2	Palmerston	0	0	2
2	Mount Forest.....	0	1	1
4	Owen Sound.....	1	1	2
2	Shelburne, Ont.....	0	0	2
3	Orangeville.....	0	0	3
1	Tottenham.....	0	0	1
2	Alliston	0	0	2
2	Collingwood.....	0	0	2
2	Barrie	0	0	2
2	Guelph	1	0	1
1	Berlin	0	0	1
2	Waterloo.....	1	0	1
1	Goderich	1	0	0
1	Clinton.....	1	0	0
11	Winnipeg, Man	2	4	5
1	St. Boniface.....	0	0	1
8	Vancouver, B.C.....	2	2	4
3	New Westminster... ..	0	1	2
99		25	18	56

In the foregoing statement I have distinguished between those of the adulterated samples which have been sold as ‘pure’ or ‘genuine’ and others which have been sold simply as ‘white lead’ or under fancy names, such as ‘No. 1’ ‘Anchor’ ‘Extra’ ‘Compound’ &c. This is in accordance with the provisions of the Act in restraint of fraudulent sale or marking, which prohibits the use of the terms ‘pure’ or ‘genuine’ unless the white lead in oil has the composition defined in Schedule A of the Act in

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question. Out of the 99 samples collected, 56 were found to be genuine, 25 of the adulterated samples had been sold as pure, and the remaining 18 were sold without guarantee. The latter samples have all been characterised by the district analysts as 'adulterated', a perfectly justifiable proceeding on their part. This will be evident when it is considered that these sophisticated samples are in many cases marked simply 'white lead', sometimes with the words in addition, 'Warranted' 'No. 1' 'Extra' &c. The amount of admixture of the 'Barytes' varies from 12 to 78 per cent. It would be equally to the advantage of the consumer and manufacturer if the percentage present of adulterant were stated on the label. Since pure dry white lead contains 86·32 per cent lead oxide, it follows that, when ground with 8 per cent oil, the resulting pigment should contain 79·41 per cent lead oxide.

With reference to the 25 adulterated samples which were sold as pure, the vendors were required, in accordance with Section 11 of the Adulteration Act to pay the expense of collecting and analysing the samples, amounting in each case to \$9. Eighteen of these vendors complied with the demand; one appealed to the chief analyst with the result that the finding of the district analyst was confirmed; and two were relieved on showing that their samples had not been sold as pure. There still remain five vendors of this class, against whom it has been recommended that prosecutions should be instituted.

In four of the samples described in the accompanying table, the manufacturers have thought fit to print on their labels for the pure article, the words 'Government Standard'. Since the department has not taken any action beyond carrying out the provisions of the Act in restraint of Fraudulent Sale or marking, it would seem wise to discountenance the use of the words just quoted.

I beg to recommend the publication of this report and table.

I have the honour to be sir,

Your obedient servant,

THOMAS MACFARLANE,

Chief Analyst.

SAMPLES OF WHITE LEAD IN OIL

RESULTS of the Examination of

Date of Collection.	No. of Sample.	Quantity Purchased.	Cost.	Sample sold as	NAME AND ADDRESS OF	
					Vendor.	Manufacturer or Furnisher as given by Vendor.
1901.			\$ cts.	<i>Official Analyst, M. Bowman, Halifax, N.S.</i>	<i>Halifax, N.S.</i>	
Feb. 19	20031	3 lbs.....	0 36	Pure white lead....	F. Reardon, painter...	P. D. Dods & Co., Montreal.
" 19	20032	3 "	0 25	"	W. Horton & Son, painters.	" "
" 19	20033	3 "	0 35	H & P Anchor brand; decorative white lead	G. H. Cutlip, painter..	Henderson & Potts, Halifax, N.S.
" 19	20034	3 "	0 30	Ramsay's Exterior....	Moore & Martin, painters.	A. Ramsay & Co., Montreal.
" 20	20035	3 "	0 30	.....	Black Bros. & Co., hardware.	British North American Paint Co., Montreal.
" 20	20036	3 "	0 30	London No. 1 not guaranteed pure.	A. J. Grant & Co., hardware.	Henderson & Potts, Halifax, N.S.
" 20	20037	3 "	0 30	Green Seal brand; pure white lead.	Crowell Bros., hardware.	Sherwin & Williams Co., Montreal.
" 20	20038	3 "	0 30	B B genuine white lead.	Walsh Bros.....	Brandram Bros., London, England.
					<i>St. John, N.B.</i>	
" 18	17768	3 "	0 30	Chemically pure.....	James Robertson Co., Limited.	Vendors
" 18	17769	3 " ..	0 30	" Decorators " pure lead; Association No. 357963.	A. M. Rowan, 331 Main street.	Canada Paint Co., Montreal.
" 18	17770	3 " (1 lb. tins.)	0 33	Pure lead ..	P. Nase & Son, 70 Bridge street.	Henderson & Potts, Halifax, N.S.
" 19	17771	6 lbs. (3 tins.)	0 72	Not guaranteed pure..	W. H. Thorne & Co., Prince Wm. street.	British North American Colour Co.
					<i>Fredericton, N.B.</i>	
" 26	17772	3 lbs.....	0 30	" Decorators " pure...	J. G. Neill, 354 Queen street.	P. D. Dods & Co., Montreal.
" 26	17773	3 "	0 30	Green Seal brand; strictly pure.	" "	Sherwin & Williams Co., Montreal.
" 26	17774	3 "	0 30	Brandram's genuine...	G. Tweeddale & Co., Queen street.	Henderson & Potts, Halifax, N.S.
" 26	17775	3 "	0 30	Elephant brand; Association No. 592217.	R. Chestnut & Sons, Queen street.	Canada Paint Co., Montreal.
				<i>Official Analyst Dr. M. Fiset, Quebec.</i>	<i>Montreal.</i>	
" 14	19785	3 "	0 24	" Decorators " pure white lead.	E. Archambault, 661 Notre Dame street.	P. D. Dods & Co., Montreal.
" 14	19786	3 "	0 24	Pure white lead.....	" "	" "
" 16	19787	3 "	0 24	Special "decorators" white lead; warranted.	H. Sylvester & Son, 701 St. Lawrence street.	" "
					<i>St. Hyacinthe, Que.</i>	
" 18	19788	3 "	0 23	Warranted pure.....	Eugene L. Desautel, Cascade street.	Canada Paint Co.....
" 18	19789	3 "	0 24	Association No. 597670	N. Beaunayer, Cascade street.	Henderson & Potts, Halifax, N.S.
					<i>Montreal.</i>	
" 19	19791	3 "	0 27	Pure white lead.....	A. Beaudoin, 49 St. Lawrence street.	P. D. Dods & Co., Montreal.
" 19	19792	3 "	0 30	Association No. 606202	Wall Bros., 15b Bleury street.	Canada Paint Co.....

SESSIONAL PAPER No. 14

99 Samples of White Lead in Oil.

RESULTS OF ANALYSIS.				No. of Sample.	Remarks of Official Analyst.
Lead Oxide.	Carbon Dioxide.	Barium Sulphate.	Oil.		
p. c.	p. c.	p. c.	p. c.		
.....	61·13	.....	20031	Adulterated with barium sulphate.
.....	17·09	.....	20032	" "
.....	26·58	.....	20033	" "
.....	22·19	.....	20034	" "
.....	62·51	.....	20035	" "
.....	40·67	.....	20036	" "
80·41	20037	Unadulterated.
80·49	20038	"
77·39	6·77	17768	"
79·48	6·24	17769	"
75·58	7·39	17770	"
23·91	57·20	7·68	17771	Adulterated with barium sulphate.
70·34	7·59	4·79	17772	" "
80·36	4·00	17773	Unadulterated.
79·67	4·97	17774	"
77·91	7·24	17775	"
74·10	6·80	7·26	19785	Adulterated with barium sulphate.
75·05	6·85	6·24	19986	" "
56·85	27·50	5·38	19787	" "
79·85	7·00	19788	Genuine.
79·95	5·32	19789	"
77·25	3·25	7·28	19791	Adulterated with barium sulphate.
78·95	7·46	19792	Genuine.

1-2 EDWARD VII., A. 1902

RESULTS of the Examination of

Date of Collection.	No. of Sample.	Quantity Purchased.	Cost.	Sample sold as	NAME AND ADDRESS OF	
					Vendor.	Manufacturer or Furnisher as given by Vendor.
1901.			\$ cts.		<i>St. Johns, Que.</i>	
Feb. 21	19793	3 lbs.....	0 25	Pure white lead.	J. A. Lomme, Richelieu street.	Dominion Oil Cloth Co., Montreal.
" 21	19794	3 "	0 24	"	C. O. Gervais, Richelieu street.	P. D. Dods & Co., Montreal.
" 21	19795	3 "	0 24	Pure	Alex. Godin.....	L. Lafleur, Montreal....
					<i>Three Rivers, Que.</i>	
" 22	19796	3 " .. .	0 24	Chemically pure white lead.	Josh. Godin et fils, 10 Forges street.	J. Robertson Co., Ltd., Montreal.
" 22	19797	3 "	0 21	Seal brand strictly pure.	Panneton & Blouin ...	Sherwin & Williams, Montreal.
					<i>Quebec.</i>	
" 27	19798	3 "	0 30	Pure... ..	Lapointe & Lapointe, 100 Crown street.	P. D. Dods & Co., Montreal.
" 27	19799	3 "	0 30	"	Gauthier & Frere, St. Joseph street.	Henderson & Potts, Halifax, N.S.
" 27	19800	3 "	0 25	"	L. C. Giguère, 314 St. Joseph street.	P. D. Dods & Co., Montreal.
" 27	19801	3 " . . .	0 25	" taken from 200 lbs barrel.	Pouliot & Gervais, 402 St. Joseph street.	" "
					<i>Official Analyst, Dr. F. X. Valade, Ottawa.</i>	
					<i>Ottawa.</i>	
" 14	20811	4 lbs.....	0 32	Warranted pure ; from 25 lb. keg ; association No. 503690.	John Storr, 404 Bank St.	Wm. Hill, Montreal....
" 14	20812	3½ lbs.....	0 25	Chemically pure; association No. 545833.	Thos. Birkett & Son, Bank St.	Montreal Rolling Mills Company.
" 14	20813	3 tins (6 lbs.)	0 60	Not guaranteed	" " ..	" " ..
" 14	20814	3 tins (3 lbs.)	0 30	"	W. Graham, Bank St.	British North America Colour Company.
" 14	20815	5 lbs. from 25 lb. keg.	0 50	Guaranteed to be absolutely pure.	Geo. Philbert, 97 Clarence St.	P. D. Dods & Co., Montreal.
" 14	20816	25 lb. can.	1 85	"Decorators" pure...	O'Connor & O'Callaghan Co., 819 Bank St.	" " ..
					<i>Brockville, Ont.</i>	
" 15	20818	4 lbs. from 25 lb. keg.	0 32	Anchor Decorative....	A. G. Dobbie & Co....	Henderson & Potts, Halifax, N.S.
" 15	20819	5 lbs. from 25 lb. keg.	0 40	"Decorators"; warranted pure ; Association No. 554231.	B. D. Steacy.....	The Canada Paint Co., Montreal.
" 15	20820	" ..	0 40	Elephant brand; genuine ; Association No. 516306.	"	" " ..
" 15	20821	3 tins (9 lbs.)	0 99	Not guaranteed	R. H. Smart.....	Name not on label ; vendor purchased from P. D. Dods & Co.
					<i>Kingston, Ont.</i>	
" 16	20822	5 lbs. from 25 lb. keg.	0 40	Elephant brand; Association No. 358873.	A. Strachan	Canada Paint Co., Montreal.
16	20823	4½ lbs. from 25 lb. keg.	0 25	Tiger brand ; chemically pure ; Association No. 576563.	"	Montreal Rolling Mills Company.
16	20824	" ..	0 32	Maple Leaf ; extra white lead.	John Corbett.....	" " ..
16	20825	6 lbs. from 25 lb. keg.	0 48	Government Standard; pure white lead.	W. A. Mitchell.....	Elliott & Co., Toronto...

SESSIONAL PAPER No. 14

99 Samples of White Lead in Oil—Continued.

RESULTS OF ANALYSIS.					Remarks of Official Analyst.
Lead Oxide.	Carbon Dioxide.	Barium Sulphate.	Oil.	No. of Sample.	
p. c.	p. c.	p. c.	p. c.		
79·40	.....	. . . . .	6·96	19793	Genuine.
76·45	.....	3·65	6·94	19794	Adulterated with barium sulphate.
79·95	.....	.....	6·76	19795	Genuine.
79·65	.... .	.....	7·06	19796	"
80·35	.....	.....	5·95	19797	"
75·45	.....	5·40	7·24	19798	Adulterated with barium sulphate.
63·55	.....	20·00	6·34	19799	" "
72·10	.....	7·85	8·14	19800	" "
74·25	.....	6·25	7·42	19801	" "
79·50	8·87	.. . . .	8·05	20811	Not adulterated.
79·44	8·79	. . . . .	7·94	20812	"
35·19	4·00	50·29	8·74	20813	Adulterated.
35·87	4·22	48·36	9·99	20814	"
72·30	7·82	7·47	8·22	20815	"
71·20	7·50	8·17	9·24	20816	"
56·57	6·29	27·54	7·38	20818	"
80·72	9·05	.....	7·14	20819	Not adulterated
79·63	8·44	.... .	7·98	20820	"
49·85	5·46	34·48	8·54	20821	Adulterated.
80·44	8·94	.....	7·08	20822	Not adulterated
78·24	8·56	. . . . .	8·22	20823	"
51·12	5·52	32·77	7·36	20824	Adulterated.
78·44	8·27	.....	8·56	20825	Not adulterated

1-2 EDWARD VII., A. 1902

RESULTS of the Examination of

Date of Collection.	No. of Sample.	Quantity purchased.	Cost.	Sample sold as	NAME AND ADDRESS OF	
					Vendor.	Manufacturer or Furnisher as given by Vendor.
1901.			\$ cts.	<i>Official Analyst, Dr. W. H. Ellis, Toronto.</i>	<i>Stratford, Ont.</i>	
Feb. 18	19452	3 lbs.	0 24	Elephant brand ; pure.	Graber & Son.... <i>Listowel, Ont.</i>	Canada Paint Co., Mont-real.
" 18	19453	3 "	0 30	Pure	Adolph & Bonnett....	Elliott & Co., Toronto...
" 18	19454	3 "	0 25	"	S. Bicker..... <i>Palmerston, Ont.</i>	P. D. Dods & Co., Mont-real.
" 18	19455	3 "	0 25	Elephant brand ; genu- ine.	Chalmer Bros.....	Canada Paint Co., Mont-real.
" 18	19456	3 "	0 25	Pure ; Association No. 448413.	Wm. Lynch <i>Mount Forest, Ont.</i>	" " ..
" 19	19457	3 "	0 25	Genuine ; Association No. 448185.	J. P. Noonan.....	" " ..
" 19	19458	3 "	0 25	Extra Standard.....	Scott & Murphy <i>Owen Sound, Ont.</i>	Sanderson Percy, To- ronto.
" 20	19459	3 "	0 25	Pure	Chester Bros.....	P. D. Dods & Co., Mont-real.
" 20	19460	3 "	0 25	Pure ; Association No. 423460.	"	Ontario Lead and Wire Co., Toronto.
" 20	19461	3 "	0 25	Unicorn white lead ; Association No. 550842.	F. N. Lepad	A. R. Ramsay & Son, Montreal.
" 21	19462	3 "	0 25	External white lead..	"	" " ..
" 21	19463	3 " ...	0 25	Pure ; Government Standard.	W. A. Hillhouse.....	Elliott & Co., Toronto...
" 21	19464	3 "	0 25	Pure ; Champion white lead.	J. J. Metcalfe <i>Orangeville, Ont.</i>	Steward & Wood, Toronto
" 21	19465	3 "	0 25	Pure ; Government Standard white lead.	Brett & Taylor.....	F. Frost, Toronto. ...
" 21	19466	3 "	0 25	Pure ; Association No. 301047.	Adamson, Hewett & Sproal.	Canada Paint Co., Mont-real.
" 21	19467	3 "	0 25	Pure ; Association No. 541970.	F. J. Marshall.....	Ontario Lead and Wire Co., Toronto.
" 22	19468	3 "	0 25	<i>Official Analyst, F. T. Harrison, London, Ont.</i>	<i>Tottenham, Ont.</i>	
" 22	19469	3 " ...	0 25	Chemically pure.....	L. P. Foucar <i>Alliston, Ont.</i>	Jas. Robertson & Co., Toronto.
" 22	19470	3 " ...	0 25	Pure	J. J. Cain.....	Elliott & Co., Toronto...
" 22	19470	3 " ...	0 25	Pure ; Elephant brand ; Association No. 567370.	W. B. Clifton.....	A. Ramsay & Son, Mon- treal.

SESSIONAL PAPER No. 14

99 Samples of White Lead in Oil—Continued.

RESULTS OF ANALYSIS.				No. of Sample.	Remarks of Official Analyst.
Lead Oxide.	Carbon Dioxide.	Barium Sulphate.	Oil.		
p. c.	p. c.	p. c.	p. c.		
74·72	12·13	.....	12·09	19452	Genuine.
74·60	11·53	.....	12·58	19453	"
65·27	8·88	13·10	11·14	19454	Adulterated by admixture with barium sulphate to the extent of 13 per cent.
81·40	11·55	.....	5·23	19455	Genuine.
78·08	11·16	.....	9·05	19456	"
76·14	9·92	.....	11·89	19457	"
35·54	4·88	28·21	30·51	19458	Adulterated by admixture with 28 per cent of barium sulphate.
66·92	8·62	12·44	10·17	19459	Adulterated by admixture with 12 per cent of barium sulphate.
74·85	10·26	.....	13·07	19460	Genuine.
76·76	11·51	... ..	10·26	19461	"
34·65	5·09	25·81	33·85	19462	Adulterated by admixture with 25 per cent of barium sulphate.
75·87	12·30	.....	10·75	19463	Genuine.
77·04	11·65	.....	9·87	19464	"
77·40	10·91	.....	9·93	19465	"
75·50	11·10	.....	11·87	19466	"
75·60	10·18	.....	12·32	19467	"
78·86	12·20	.....	7·60	19468	Unadulterated.
78·59	12·58	.....	8·44	19469	"
78·50	10·76	.....	7·76	19470	"

RESULTS of the Examination of 99

Date of Collection.	No. of Sample.	Quantity purchased.	Cost.	Sample sold as	NAME AND ADDRESS OF	
					Vendor.	Manufacturer or Furnisher as given by Vendor.
1901.			\$ cts.		<i>Collingwood, Ont.</i>	
Feb. 22	19471	3 lbs.	0 25	Pure ; Association No. 557905.	White Bros.	Canada Paint Co., Montreal.
" 22	19472	3 "	0 25	Pure ; Association No. 594086.	J. Henderson.	" " .
					<i>Barrie, Ont.</i>	
" 22	19473	3 "	0 25	Pure	Johnson & Warren.	Jas. Robertson & Co., Toronto.
" 22	19474	3 "	0 25	Pure ; Association No. 567415.	J. R. Harbly.	Canada Paint Co., Montreal.
					<i>Guelph, Ont.</i>	
" 22	19475	3 "	0 25	"Decorators" pure.	G. A. Richardson.	P. D. Dods & Co., Montreal.
" 22	19476	3 "	0 25	Pure ; Association No. 448461.	John M. Bond.	Canada Paint Co.
					<i>Berlin, Ont.</i>	
" 22	19477	3 "	0 25	Pure	Peter Hyman.	Jas. Robertson & Co., Toronto.
					<i>Waterloo, Ont.</i>	
" 22	19479	3 "	0 25	"	M. Werchal & Son.	" " ..
" 22	19480	3 "	0 25	"	Leitch & Liphardt	P. D. Dods & Co., Montreal.
					<i>Goderich, Ont.</i>	
" 22	19481	3 "	0 25	"Decorators" pure.	A. McD. Allen.	" " ..
					<i>Clinton, Ont.</i>	
" 22	19482	3 "	0 25	"	Davis & Rowlan.	" " ..
				Official Analyst, E. B. Kenrick, Winnipeg, Man.	<i>Winnipeg, Man.</i>	
" 21	17310	3 tins.	0 45	"Decorators" pure.	J. H. Ashdown.	Canada Paint Co., Montreal.
" 21	17311	3 "	0 30	Compound	"	" " ..
" 21	17312	2 lbs.	0 20	Pure ; Association No. 566601.	"	" " ..
" 22	17313	3 "	0 30	Pure (Crown brand) ; Association No. 586955	G. F. Stephens Co.	" " ..
" 25	17314	3 "	0 30	Ramsay's Exterior Compound.	R. Wyatt.	Ramsay & Son, Montreal
" 25	17315	3 "	0 30	"Decorators" pure.	Mackenzie Bros.	P. D. Dods & Co., Montreal.
" 26	17316	3 "	0 30	Pure ; Association No. 570826.	F. W. Weir & Co.	Canada Paint Co.
" 26	17317	3 "	0 30	Pure ; Association No. 467369.	C. A. Baskerville	"
" 26	17318	3 tins (2 lbs. each)	1 00	Compound	Watt & Gordon.	"
					<i>St. Boniface, Man.</i>	
" 27	17319	3 lbs.	0 30	Pure ; Association No. 473026.	Allaire & Bleau.	"

SESSIONAL PAPER No. 14

Samples of White Lead in Oil—*Continued.*

RESULTS OF ANALYSIS.				No. of Sample.	Remarks of Official Analys
Lead Oxide.	Carbon Dioxide.	Barium Sulphate.	Oil.		
p. c.	p. c.	p. c.	p. c.		
79·16	12·08	... ..	7·56	19471	Unadulterated.
76·52	11·73	.....	10·58	19472	"
79·31	12·94	.....	6·84	19473	"
79·37	12·30	.....	7·06	19474	"
71·96	12·08	7·96	8·00	19475	Adulterated with sulphate of barium.
78·93	12·86	.....	7·34	19476	Unadulterated.
79·17	11·25	.....	8·31	19477	"
78·87	12·40	.... ..	7·30	19479	"
65·76	9·57	17·42	6·28	19480	Adulterated with barium sulphate.
49·48	7·71	31·45	9·60	19481	" "
69·54	10·21	7·02	10·56	19482	" "
77·71	11·42	.....	8·69	17310	Genuine.
26·92	3·63	58·50	7·91	17311	Adulterated.
80·50	11·49	.....	5·63	17312	Genuine.
78·32	11·37	.....	8·45	17313	"
51·50	6·56	21·92	8·77	17314	Adulterated.
66·34	9·10	13·36	7·72	17315	"
77·13	10·02	... ..	7·97	17316	Genuine.
78·38	11·69	.....	7·81	17317	"
23·31	3·10	60·25	10·26	17318	Adulterated.
76·53	11·30	.....	10·10	17319	Genuine.

1-2 EDWARD VII., A. 1902

RESULTS of the Examination of 99

Date of Collection.	No. of Sample.	Quantity purchased.	Cost.	Sample sold as	NAME AND ADDRESS OF	
					Vendor.	Manufacturer or Furnisher as given by Vendor.
1901.					Winnipeg, Man.	
Feb. 28	17320	3 lbs.	0 30	"Decorators" pure...	W. R. Talbot & Co ...	P. D. Dods & Co.
" 28	17321	3 tins.	0 65	Compound	The Jas. Robertson Co.	Vendors.
				Official Analyst, Dr. C. J. Fagan, Vic- toria, B.C.	Vancouver, B.C.	
Mar. 1	21568	15 lbs.	1 15	Pure ; Association No. 460617.	Lewis & Sills	British American Paint Company.
" 1	21569	14½ "	1 20	"Decorators" pure...	McTaggart & Moserop.	P. D. Dods & Co., Mon- treal.
" 1	21570	14½ "	1 15	Pure	" " ..	" " ..
" 2	21571	12½ " ...	1 00	Genuine ; Association No. 461665.	Thos. Dunn & Co.	A. Ferguson & Co., Mon- treal.
" 4	21572	14 "	1 20	Chemically pure ; Gov- ernment standard.	"	Robertson's Dominion Lead Works, Toronto.
" 4	21573	3 2-lb.cans	0 60	.....	" .....	British American Paint Company.
" 4	21574	12½ lbs.	1 10	Tiger brand ; pure ; Association No. 545431	Vancouver Hardware Company.	Montreal Rolling Mills..
" 4	21575	12½ "	1 00	Extra	" " ..	" " ..
					New Westminster, B.C.	
" 5	21576	11½ "	0 90	Pure ; Association No. 593627.	Cunningham Hardware Company.	A. Ramsay & Son, Mon- treal.
" 5	21577	11 "	0 85	Pure ; Association No. 374277.	" " ..	" " ..
" 6	21578	3 2-lb.cans	0 60	No. 1 on cans.	McTaggart & Moserop.	P. D. Dods & Co., Mon- treal.

SESSIONAL PAPER No. 14

Samples of White Lead in Oil—*Concluded.*

RESULTS OF ANALYSIS.				No. of Sample.	Remarks of Official Analyst.
Lead Oxide.	Carbon Dioxide.	Barium Sulphate.	Oil.		
p.c.	p.c.	p.c.	p.c.		
52·47	7·16	29·66	7·92	17320	Adulterated.
27·13	3·78	58·24	7·99	17321	"
After extraction of the oil.					
86·80	8·60	.....	6·60	21568	Genuine.
72·87	10·65	15·00	7·70	21569	Barium added ; adulterated.
75·44	5·85	11·50	7·70	21570	"
74·69	7·10	.....	6·50	21571	Genuine.
87·87	11·40	.....	6·80	21572	"
15·32	4·10	78·00	9·90	21573	Adulterated with barium sulphate.
86·67	10·80	.....	5·70	21574	Genuine.
47·15	7·55	45·70	6·30	21575	Adulterated with barium sulphate.
85·20	11·90	.....	7·10	21576	Genuine.
86·30	11·40	.....	7·00	21577	"
17·57	2·40	70·30	9·30	21578	Adulterated with barium sulphate.

